

COMMERCIAL CAR JOURNAL

and OPERATION & MAINTENANCE

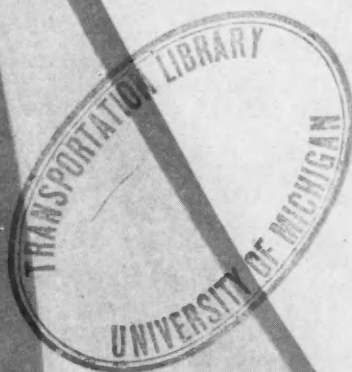
JULY 1929



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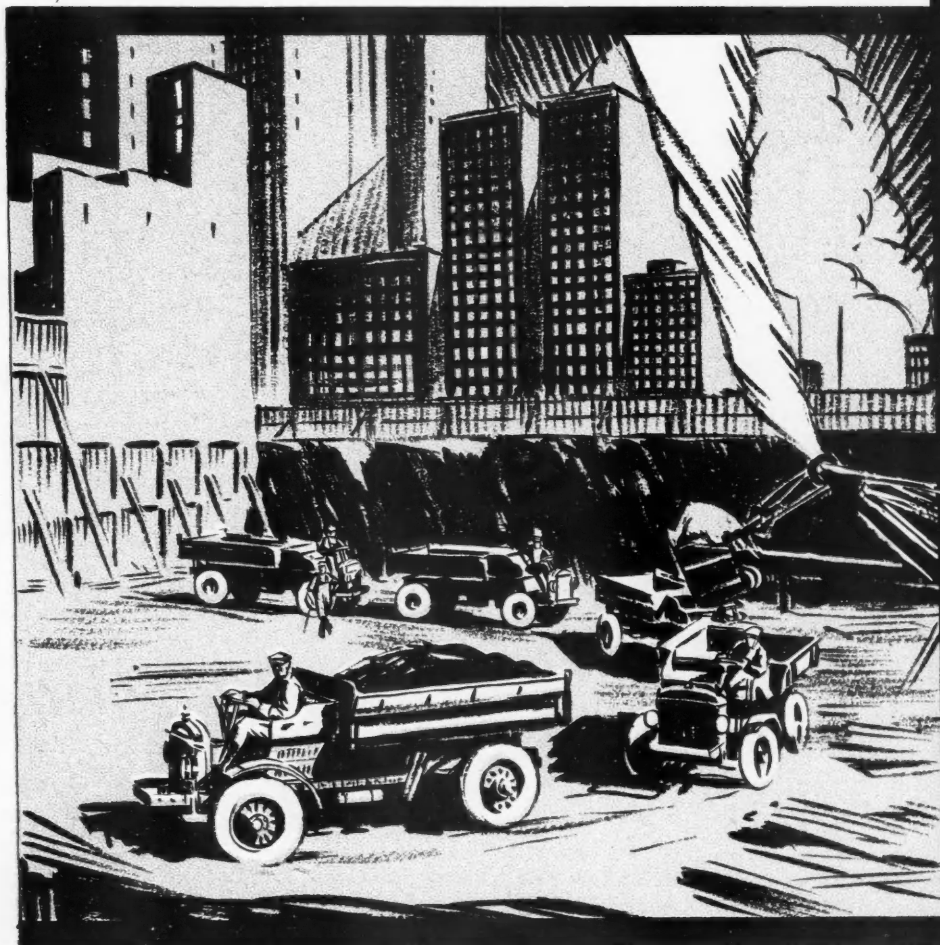


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and OPERATION & MAINTENANCE

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WYMAN-GORDON CRANKSHAFTS



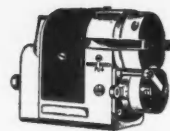
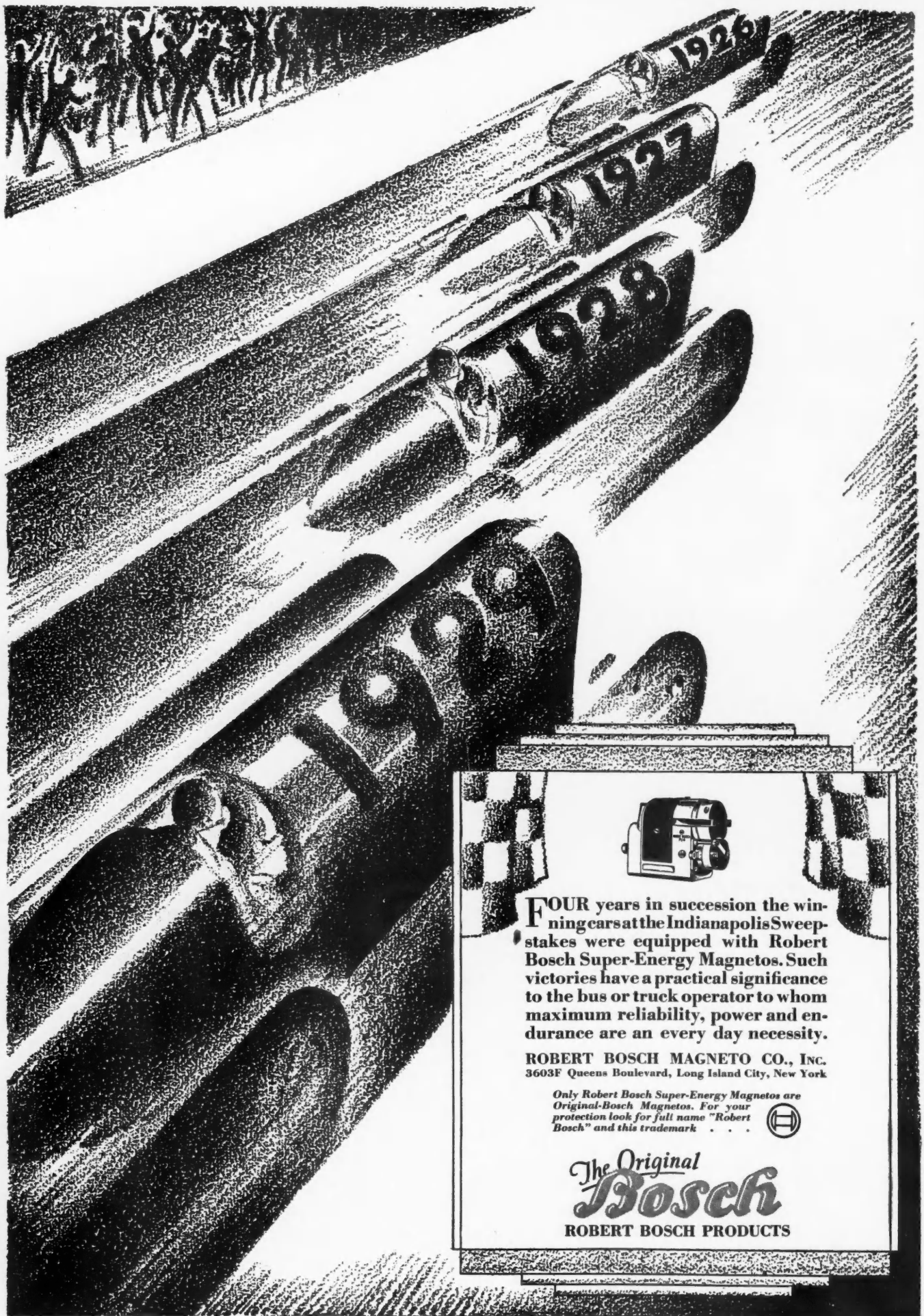
A SUCCESS THAT PARALLELS THE SUCCESS OF THE INDUSTRY ITSELF

WYMAN-GORDON

THE CRANKSHAFT MAKERS

**WORCESTER, MASS.
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July, 1929



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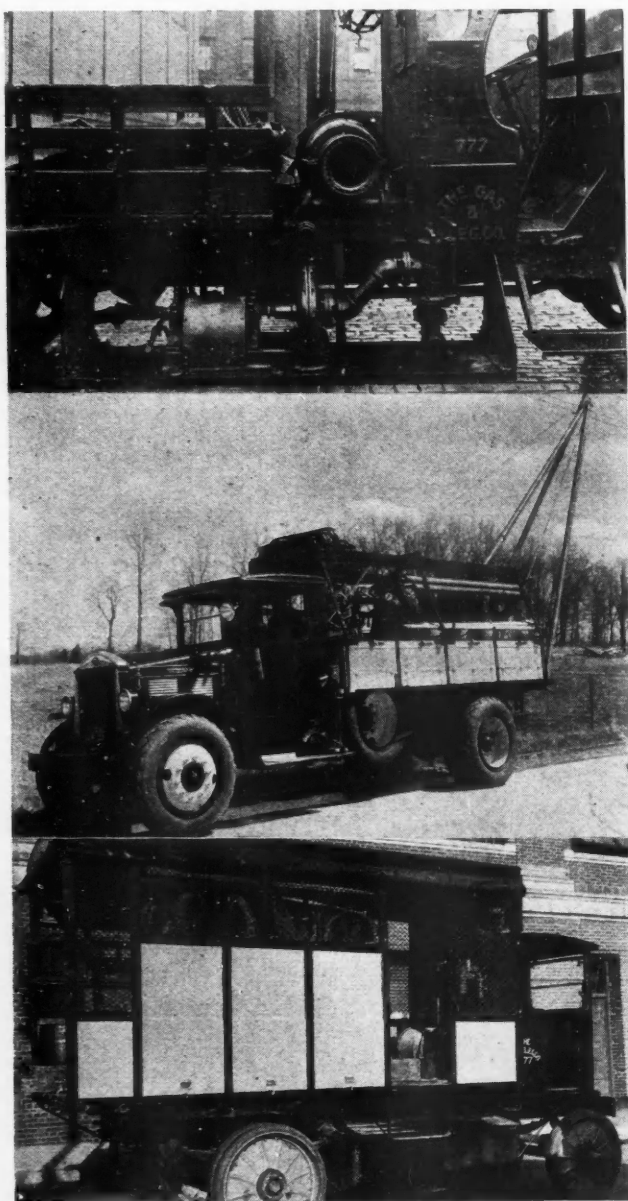
THE great progress made in the last few years in truck design is generally taken as a matter of course which evokes no fascinated oh's and ah's. That's because few persons even in the industry have had the opportunity to see the modern truck conquer road and field conditions which a few years back were considered impassable to all but specially engineered vehicles. The tests at the Camp Holabird Transportation Pageant (reported on page 30) furnished conclusive proof that the truck industry has progressed so far in engineering that today stock trucks are capable of negotiating the obstacles that once were insurmountable. Stiff grades, sandy, gravelly, muddy and rocky roads no longer defeat the stock truck. Today's accomplishments of the truck are evidence of the alertness of manufacturers to operators' demands, whether the operation is over improved highways or over the roughest cross-country terrain.



SAVE MAN POWER

Infinite Possibilities for Conserving Labor Are Provided by Equipping Trucks With Auxiliary Devices

By James W. Cottrell



Above: Truck equipped for underground cable work. A centrifugal pump driven by power take-off is used for pumping manholes and the winch for cable pulling. Center: A self-moving portable workshop for line construction is this 3½-ton Diamond T carrying a winch and demountable derrick with tackle, hand tools and supplies. Bottom: A cable pulling winch operated by electric motor taking power from the battery of the Walker truck



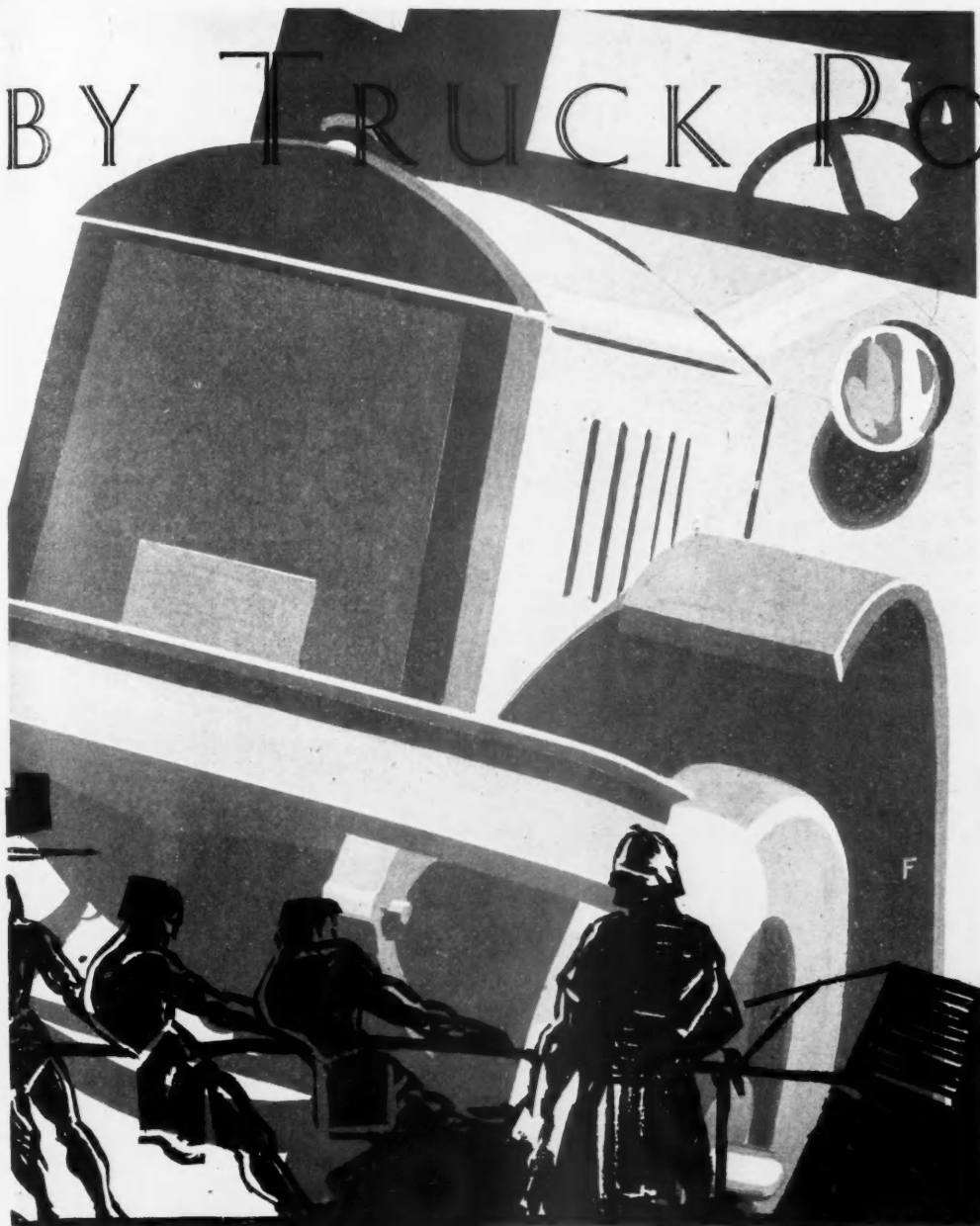
TRUCKS are being used in increasing numbers for services other than the primary function of transportation for which they are built. Equipped with engine power-operated auxiliary devices such as winches and pumps, a truck becomes a self-moving machine with almost infinite possibilities for saving labor.

Such equipment is naturally of particular value to public utilities, but there is a growing conviction that the usefulness of these units might well be further extended into other fields.

"Our special equipment trucks are not trucks, as we ordinarily use that term, they are portable workshops. We look upon them as tools rather than transportation units," is the way one public utility fleet superintendent expressed the idea. Another said that doing without this equipment would be like going back to horse-car days.

Labor-saving which results from use of these devices runs into a lot of money even in small fleets, as may be judged from the fact that one line-

BY TRUCK POWER



ble in many lines of work. They are used for direct pulls and in connection with derricks, loading devices and tackle. For handling heavy objects, such as cast-iron pipe, a crane is permanently mounted on the body of the truck and lifting is done by a winch.

A demountable derrick and winch combination is popular in the public utility field. The derrick is made up of sections of steel tubing, and when not in use is carried in brackets on the truck body. The derrick can be erected by two men in a few minutes, which is an advantage when poles are being set considerable distances apart, as in the case of those damaged by traffic mishaps.

These winches used for pole-setting usually incorporate an irreversible worm drive, so that the weight being lifted may be held at any desired point by releasing the clutch.

A unit of this type reduces the number of men in a pole-setting crew from 12 to five, according to the transportation superintendent of a large

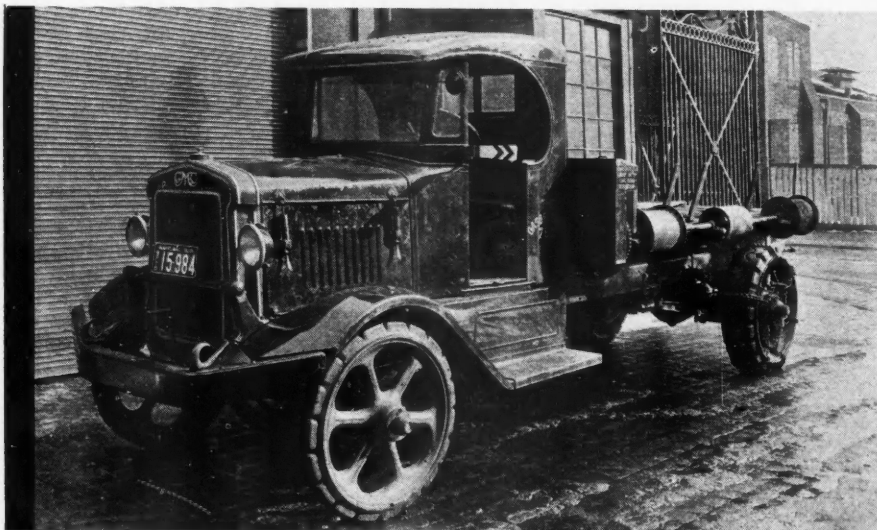
construction foreman figured the value of a winch and derrick at \$35 per day. In addition to reducing the amount of labor involved in certain jobs, these trucks perform a lot of work which it would be difficult, or impossible, to do by man power.

Considering the variety of work which is done outdoors, it is not surprising that many different types of power-driven equipment have been developed for these jobs. Winches and capstans, pumps and air compressors represent types of machines, developed in other fields, which have been adapted to truck use. In addition to these, many special devices, such as earth-boring attachments, have been designed especially for use on trucks.

Winches are indispensable

A crane with trolley hoist and winch saves work in loading and unloading heavy water pipe





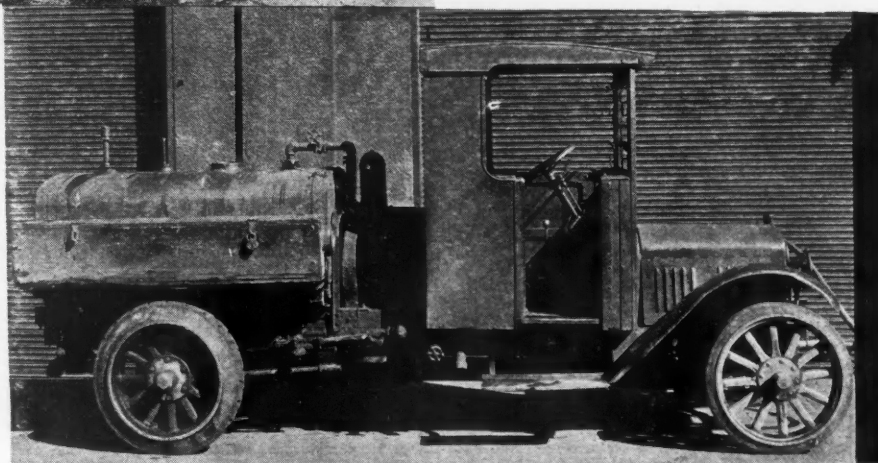
Gas companies find many uses for truck equipment. The truck at right has a power-driven pump for withdrawing condensation from gas main traps and discharging it into the tank. Above is shown a GMC truck with side winches for loading pipe

public utility in the South. Five men with the truck and winch-derrick combination do much more work than do 12 men who pike poles into position. In fact, of the five men in the truck crew, only three set poles and the other two attach crossarms.

Allied with pole-setting is the job of digging holes for the poles. Earth-boring attachments have been developed for this service. These comprise an auger mounted on a vertical shaft which is driven by the engine and also may be raised and lowered by power. A swivel mechanism makes it possible to bore holes at an angle with the truck frame level.

Because the holes are relatively small in diameter, usually 18 in. to 24 in., for their depth it is very difficult to dig them by hand. In hard soil or gravel it may require several hours to dig a hole which can be bored in a matter of minutes by power.

A truck with earth-borer takes the place of about 25 men on line construction, in the opinion of an executive in charge of this work. This advantage is figured while the truck is working. There is another factor to consider, as this executive pointed out. It is quite a job to keep a gang of 25 men busy all the time. If the gang is not kept together, there is the bother and overhead cost of hiring men when needed and the loss in efficiency while new men are becoming accustomed to the job, and to each other. All of which costs money.



When a new line is being constructed, it is customary to have one truck for hole-boring and another for pole-setting. However, a winch and derrick may be mounted on the earth-boring truck, making this unit capable of both jobs. The earth-boring attachment usually is removable, so that the truck may be used for other services. Boring outfits with self-contained powerplants, which may be mounted on the body of a standard truck, are also available for this purpose.

Placing wires or cables underground by no means eliminates the need of special trucks. On the contrary, there are two jobs in connection with underground work for which trucks are particularly adapted. These are pumping out manholes and pulling cables. Companies having both overhead and underground lines to maintain mount both pump and cable-pulling equipment on the same trucks. For inspection work and repairs in manholes, not involving pulling of cables, a light truck with pump mounted in front of the radiator is frequently used. Heavier trucks are equipped with centrifugal pumps mounted on the side and driven from the power take-off.

Pumping units vary in capacity, but those capable of discharging 150 to 200 gal. per minute are common. Translated into terms of saving man-

power, that means, as one official put it, that such a rig pumps more water in 15 minutes than a man can pump in a day.

Underground cables are placed in ducts extending from manhole to manhole. In case of trouble, a section of cable is pulled out of the duct and another pulled through in its place.

As some sections are 500 or 600 ft. long, there is a lot of friction, and it takes a lot of pull to move the cable. On the other hand, the pull must not be too hard, otherwise the cable may be damaged.

Pulling of the cable is done by drawing a winch line through the duct, fastening the cable to the end and drawing the line back through the duct. A comparatively slow, steady,

powerful pull is required. To prevent damage to cables, a scale which measures tension is incorporated in many of the outfits.

When hand methods are employed, the cable is pulled by a hoist or block-and-tackle, and a new "bite" must be taken on the cable at short intervals. Power-pulling is so firmly established that comparative figures are difficult to obtain. Questioned on this point, an underground line maintenance man said that it has been so long since he pulled a cable by hand that he did not know how long it would take to do the job that way.

There are innum-

An FWD truck with demountable derrick hoisting a pole into position over a hole dug by the earth-boring attachment



able jobs on construction operations which call for lifting or pulling lighter loads than those ordinarily handled by winches. Niggerheads, mounted on the ends of the winches, save a lot of time on such jobs. A rope is coiled about the rotating spool and a load can be lowered or raised with no more effort than that required to play out or haul in the rope.

Capstans, power-driven, of course, perform somewhat the same service as niggerheads. They are made to handle rope which is manipulated by a workman. Rope can be pulled from any point on its length by taking a few turns about the drum, and this is often a convenience in lifting or lowering heavy objects.

Public utilities have no monopoly on the use of winches and capstans. General contractors, haulers, riggers, steel erectors and warehousemen have occasion to roll or hoist heavy weights, and they can, and do, make use of the power of truck engines for this service.

A job for which power-hoisting equipment is particularly desirable is that of placing transformers on poles or platforms or in underground vaults. The job can be done with a single block and a steel winch line, or with a block-and-rope tackle. It takes a lot longer to get ready to do the job by hand than it does to hoist the transformer by power. In this connection it is well to remember that heavy weights can be moved by hand by the use of pulleys and rope, but it takes quite a while to rig up such an outfit, pull out the rope and put it all back in the truck after the work is finished. Holding a weight in the air with block and tackle takes at least one man, while a truck driver can raise, hold or lower and leave one man free for other duties.

Gas companies have need of special power equipment, although of different type from that employed by electric, telephone and telegraph companies. Some of the equipment used by gas companies



A hole can be bored in a few minutes which might take several hours to dig by hand

also is useful to water supply companies or municipal water departments. Power-loading devices for handling pipe come within the latter classification. A crane with swinging boom, as shown in one of the accompanying illustrations, may be used, or a side-loading winch, also shown, may be employed.

Drip-collecting trucks, used by gas companies, must have some means of pumping the condensate out of traps. The job can be done by hand, but it is much easier to make use of en-

gine power for this purpose. A power take-off and small pump do the trick.

Trucks carrying air compressors are used in many different lines of business. Gas and water companies use them for pavement opening; building contractors find them useful for riveting with air hammers, while road builders employ them for rock drilling and tamping, among other jobs.

Compressors may be driven by the truck engine or by a separate engine. Self-contained engine-compressor units frequently are mounted on a truck or a four-wheel trailer. In the former instance, the truck simply moves the compressor unit about, and it may furnish transportation for only a few miles per day, although the compressor is working all day long.

A winch on a dump truck may seem an unusual combination, but it is useful for a host of jobs. A salesman found this out when a house-building contractor asked if there was not some way of moving a small concrete mixer from job to job without towing it on the street, or tying up a truck for long periods. The problem was solved by mounting a winch back of the cab and forward of the dump body on a new truck which the contractor ordered at the time. A door in the front of the body allows the line to pass to the rear of the body and the mixer is hauled into the body on inclined skids. After this unit had been in service for a few weeks the con-

(Turn to page 60, please)





GEOFF.
GRIER

IN merchandising commercial motor vehicles the writer has noticed a growing need for better facilities for storing and maintaining such vehicles when purchased by individual owners and individuals operating small fleets. The result of this apparent

need has led to the formation of a number of different types of motor truck maintenance companies and companies that contract deliveries for small operators or rent delivery equipment to mercantile concerns by the day, week, month or year and maintain these vehicles for some flat rate or variable schedule according to the particular problems.

It seems to the writer that the above conditions have, in most instances, been brought about by the desire of the management of mercantile concerns to eliminate the responsibility of maintaining and caring for the necessary motor equipment to handle their deliveries or freight. In some instances it seems to be a desire to eliminate the capi-

OWNER WORRIES A PROFIT

Growth of Companies Furnishing Fleet Operators Storage and Maintenance Under Contract Suggests Need Among Truck Branches and Distributors of New Department, Handling Similar Service

By Pat C. Harper

Manager, Truck Division, Reo Motor Car Co. of California



*Pat C. Harper,
manager, truck division,
Reo Motor Car Co. of California*

tal investment necessary to buy proper equipment. However, we believe that the deciding factor has been a desire to eliminate responsibility and troublesome details of contracting for hauling or maintaining equipment. We do not believe that the saving in dollars and cents is the important item in most cases of this kind which we have investigated where the particular company has changed from owning and operating its own motor trucks to some form of contracting.

We are quite certain that the new methods are not altogether satisfactory. No doubt the executives of many concerns would prefer to completely control all their own delivery systems if it were possible for them to eliminate most of the details and work surrounding such operations. At least this class of businessmen is willing to try a system of handling deliveries if it is backed by a sufficiently strong organization to insure its success. If our analysis of present-day motor truck conditions is correct, it would seem that the time is ripe for distributors and factory branches in large centers to broaden the scope of their businesses to include an organization that will meet this modern motor truck maintenance problem.

We believe large distributors of motor trucks and factory

branches of motor truck manufacturers which are located in distributing centers should form a department of their business which would have as its principal function the storing and maintaining of the motor trucks sold in that community. In other words, we feel that the time is ripe for the motor truck manufacturer or distributor to undertake to get closer to the problems of the owners of his vehicles so that the clients (which he has spent money to secure) will be more likely to continue as his clients because of the close cooperation which naturally comes from daily contact of maintenance companies with the drivers and owners of the vehicles stored at and operated from such location.

No doubt most distributors of motor trucks and factory branch managers, at first thought, will consider such an organization an unnecessary part of their business. In fact we have been informed by one capable truck executive that he had sufficient problems selling motor trucks and caring for them during the first few months of use to eliminate any desire to have these trucks in his place every night. However, we feel that such a maintenance department of a distributor's business, whether it is operated as one more

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FIT THE TIRE

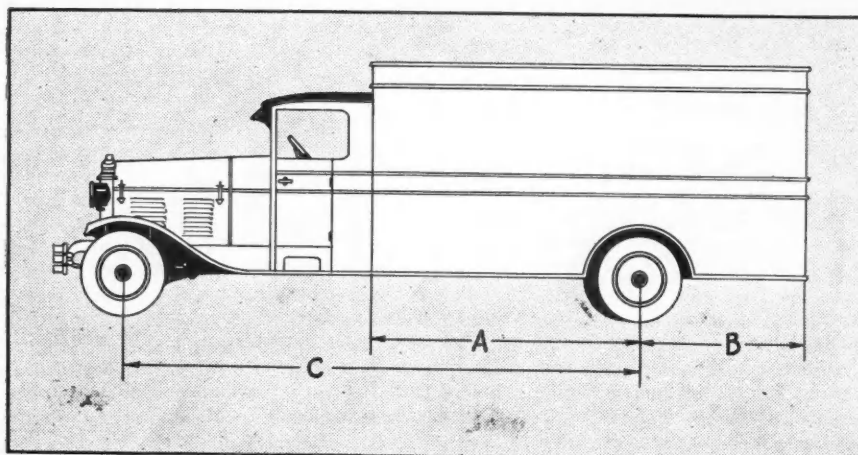
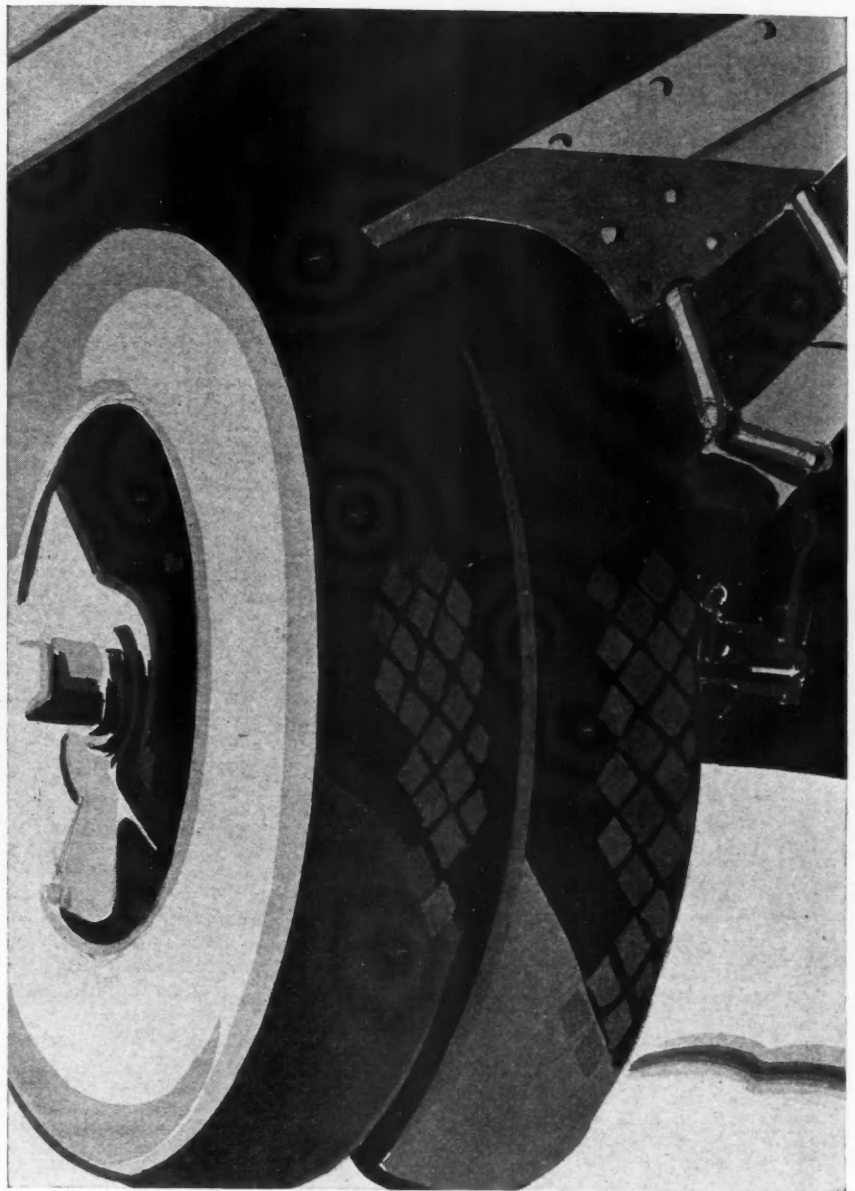
THE question of tire equipment for a new truck should be settled at the time the truck is ordered, according to a truck sales manager of long experience. He has handled his share of complaints of short tire life due to overloading and, so far as his organization is concerned, he has worked out a solution of the problem.

Truck dealers and owners and tire dealers have a common interest in seeing to it that the tires supplied with a new truck are adapted to the work the vehicle is to perform. If they work together, for the owner's interest, tire cost will be at a minimum. However, if the owner does not concern himself enough about tires to take the question up with the truck salesman from whom he buys, or if the salesman does not bother about tires when selling the truck, there may be trouble.

Let us see what happens when no thought is given to tire equipment until after the truck has been in service for a few weeks. Just one example from the experience of a tire adjuster will illustrate the point.

An owner of a new truck took the truck to the dealer from whom he purchased it and asked for the salesman with whom he did business. After an exchange of greetings the owner said: "Something wrong with the tires on

To determine distribution of load on front and rear wheels, weigh front and rear wheels separately with truck empty. Distance A minus B divided by C equals the percentage of the pay load carried on the front wheels. Multiply this percentage by the weight of pay load and add this to front wheel weight. The balance of the weight of pay load is on rear wheels



this job; had a blowout on the road last night and was an hour late getting in. No mileage at all. Ninety-day guarantee is still good, isn't it? How about a new tire?"

"That 90-day guarantee is still as good as gold. The factory makes it and we stand back of it. But the guarantee does not apply to tires. They are guaranteed by the tire company. Run down to see them. The adjuster, Bill Jones, is a fine fellow, and I know that he will take care of you. Come see us again."

Having reached the office of the tire company the owner asked for Bill Jones and repeated the tale of woe. Bill, being tactful, allowed the owner to tell all of the story before making any

TO THE LOAD



Truck Owner, Dealer and Tire Company Can and Should Determine Scientifically the Correct Tire for a Given Service

yet. Guess I am entitled to a new tire."

"Let's run down to the coal yard and weigh this truck."

Bill and the owner went to the coal yard and weighed the truck, then weighed the front wheels and the rear wheels separately. They returned to the tire store, the adjuster did some figuring, and said:

"I am very sorry to tell you that you are carrying just about twice as much on those rear tires as they are rated to carry. We guarantee our tires to be right but we cannot guarantee them if they are overloaded, certainly not when they are carrying twice as much as they are intended to carry."

"But they are the same tires I got with the truck. They should be all right."

"Did you tell the salesman how much overload you intended to carry?"

"No."

"Did you tell him how much the body that Hillman built for you weighed?"

"No."

"As I told you, I am sorry that you have had trouble with our tires but the fact is that the tires are too small for the work you are doing. We can put on an oversize or duals on the rear."

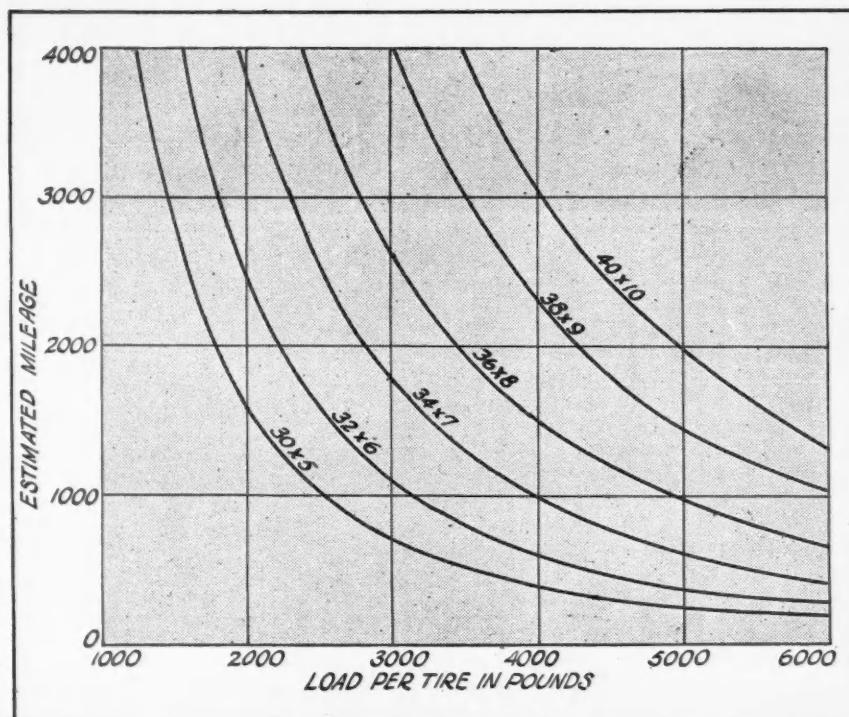
The owner, convinced that he was the subject of a lot of buck-passing, went back to the salesman and loudly expressed his disapproval of the situation in which he found himself.

What happened next depends upon many factors. There may be a policy adjustment, a change-over to duals, or other means of satisfying the owner. But the fact remains that the tires which were delivered with the truck have given very little service and someone must absorb the loss.

The case recounted here is by no means exceptional although in most instances the complaint comes later and is made because the tire life is less than expected although not short enough to justify a formal complaint.

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Chart showing how tire mileage is reduced as the load is increased



answer. The conversation went something like this:

"How far did you say that you had driven this truck?"

"About 6000 miles."

"How often do you check air pressure?"

"Every Saturday afternoon. I don't run it Saturday afternoons."

"How much does the body weigh?"

"Don't know."

"How much do you carry on it?"

"Oh, I don't overload it much. Truck is rated at 1½ tons and I carry only 2 tons most of the time. I have had a little more once or twice but not often. But look at that tire which let go last night. It has not been on three months

QUICK SERVICE IS

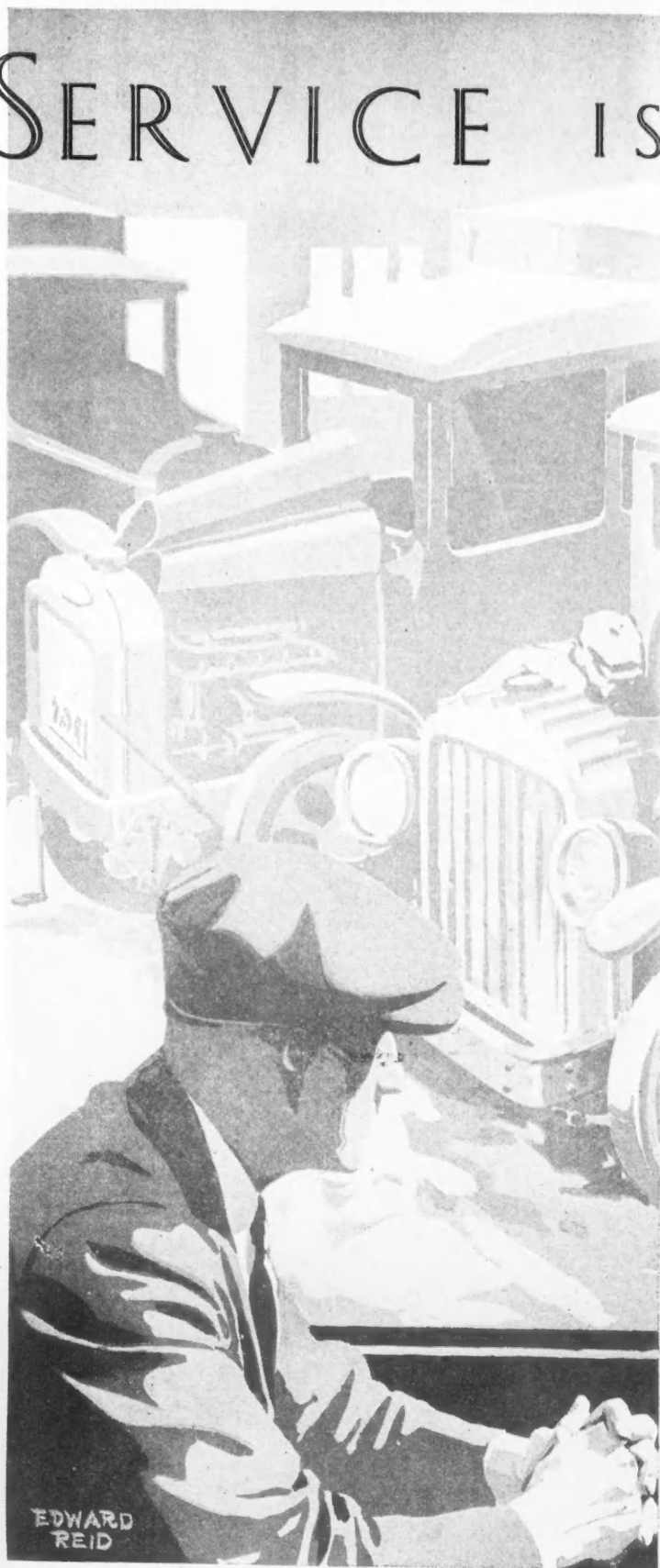
*Progressive Service Shops
Capitalize on the Need by
Merchandising Their Read-
iness to Handle Small Jobs
While the Driver Waits*

By Martin J. Koitzsch

QUICK repair jobs are the money today. Such jobs are rapidly coming to the fore in both the truck and passenger car servicing fields and dealer and branch service stations organized to supply such service are realizing handsomely on the trend. As a matter of fact, quick service business is particularly desirable today, since it enables service stations not only to stem diminishing returns because of the decreasing number of major repair jobs entering shops today, but to build up still greater profits from the many more smaller jobs.

Service managers know, without consulting their records, that the bulk of their maintenance sales today are made up of small jobs. The reasons for this are several, but of them all two are significant. First, makers have made great strides in their engineering, building longer life and better performance into their trucks, and secondly, truck owners have a better understanding of the value of preventive maintenance; they are aware that it is economical to submit their trucks to regular inspections and to correct little faults before they develop into big ones. They also prefer several short-time tie-ups in the shop to one long revenue-losing interment. As a result, periods between major overhauls have been lengthened, large maintenance sales have decreased, but small jobs have increased.

Because of this change, maintenance departments are called upon to handle service jobs which not long ago were considered small-change business that was a bother and upset regular shop routine. But, according to one service executive, who has made a success of quick service, establishment of the service is no problem if approached with an open mind and a will to adapt present facilities, personnel and shop procedure to the new needs.



Most small service jobs that can be done outside of the regular shop and without the use of machine tool equipment and within certain fixed time limits are classified as quick service jobs. Equipment employed generally comprises tools in a mechanic's kit and in many cases special equipment for the purpose, such as grease racks, pressure lubricators, brake testers, etc. The time limit set varies and is a matter that can best be determined by individual shops. Some shops set 30

TRUCK NECESSITY



Quick-Service Jobs

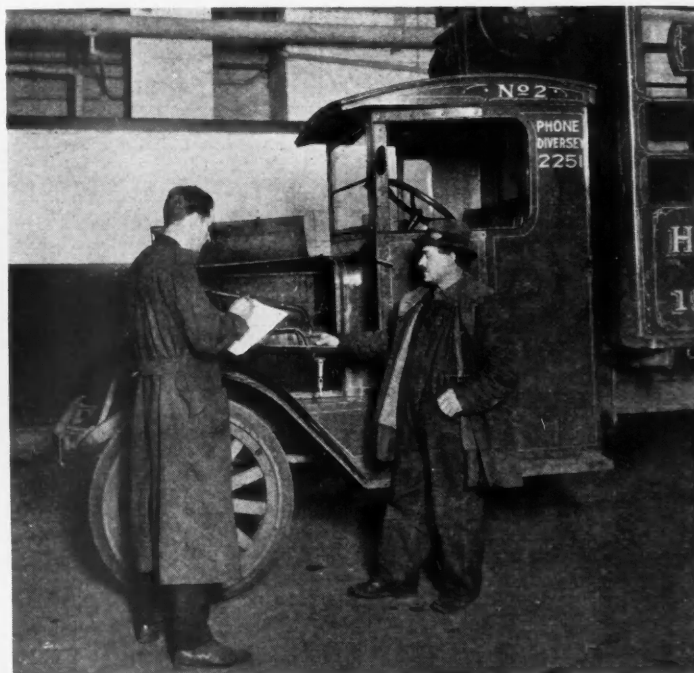
Inspection
 Engine tune-ups
 Crankcase service
 Greasing service
 Cooling system service
 Battery and tire service
 Adjust clutch and clutch brake
 Reline propeller shaft brake
 Adjust radius rods
 Change magneto and install service magneto
 Replace cylinder head gasket
 Stop vibration in radiator brace rod
 Install new hood laces
 Adjust fan belt
 Clean carburetor and fuel line screens or filters
 Tighten muffler and tailpipe brackets
 Tighten engine mounting bolts
 Align clutch or brake pedal with floor board slots
 Tighten or replace rim nuts or wedges
 Clean and adjust breaker points
 Synchronize ignition system, double breaker type
 Remove rattles from door and windshield glass
 Adjust door striker plate
 Align door lock with pillar
 Check valve and ignition timing
 Tighten and inspect instrument board
 Check ignition control system throughout for full advance and retard of spark
 Minor body and cab repairs
 Check front wheel alignment
 Adjust front wheel bearings
 Adjust rear wheel bearings or tighten wheel or shaft
 Adjust and reline brakes
 Fasten down floor boards

remembered that operations included in quick service are greater in number in shops servicing light duty chassis. For example, relining brakes on a light delivery chassis may be a quick service job, whereas a similar job on a five-ton truck may be a regular line job because it is heavier, requires shop equipment and takes more time. The type and number of jobs in the quick service classification, of course, vary in accordance with the time limit. An idea of the scope of quick service is given by the list of jobs in the accompanying table.

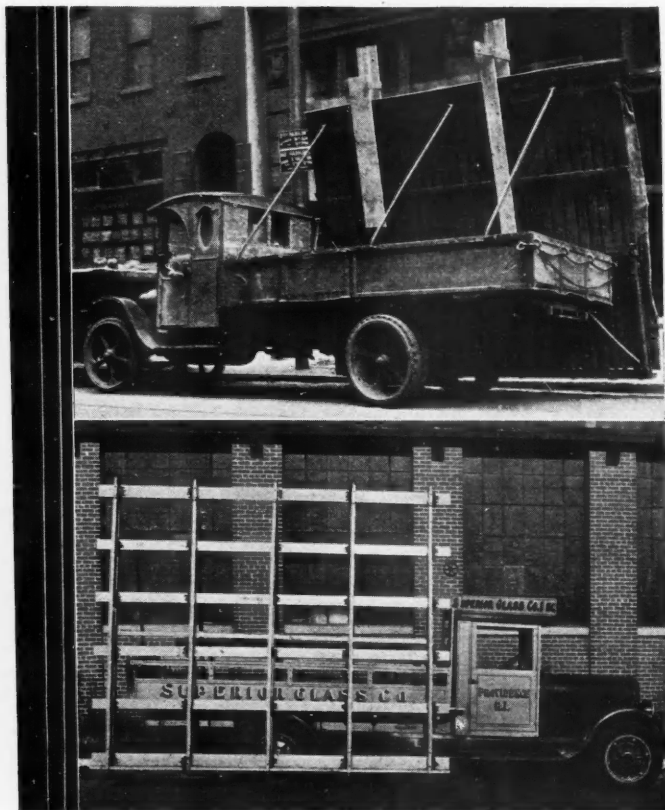
That quick service is feasible and profitable is indicated by the success of service stations already engaged in the service. These are headed by forward-looking service managers, who early sensed the swing toward quick-service specialization in the maintenance department and they are turning over a pretty penny as a result of their reorganized service policies. Others, now alert to the

(Turn to page 49, please)

minutes as the dividing line, others one hour and a few even extend the period to three hours. Various factors may alter the fixation of the time limit, such as location of the shop, space facilities, etc. Jobs extending beyond the fixed time limit are classed as regular or ordinary service jobs. It should also be



RACK BODIES EASE



Equipment Available to Glaziers Today Simplifies Handling, Speeds Deliveries and Prevents Excessive Breakage

sheets and the use of less delivery men.

Although opinions and needs differ as to detail of construction, bodies designed for hauling of glass fall into either of three general classifications, namely, those carrying glass horizontally, vertically inside the body and vertically outside of the body.

The horizontal type body generally is an express body with a removable rack placed on and supported by the sides. Outside vertical types are either specially designed or of the express type with racks mounted outside, tipped a few degrees inward and supported by irons. Inside vertical types are custom-built and consist of two or more racks supported by uprights and arranged either as a single or double "V." Variations include bodies convertible from horizontal to vertical carrying, bodies with both in and outside vertical racks, fully enclosed bodies of the vertical type and panel bodies with outside vertical racks.

While physically large sizes of glass

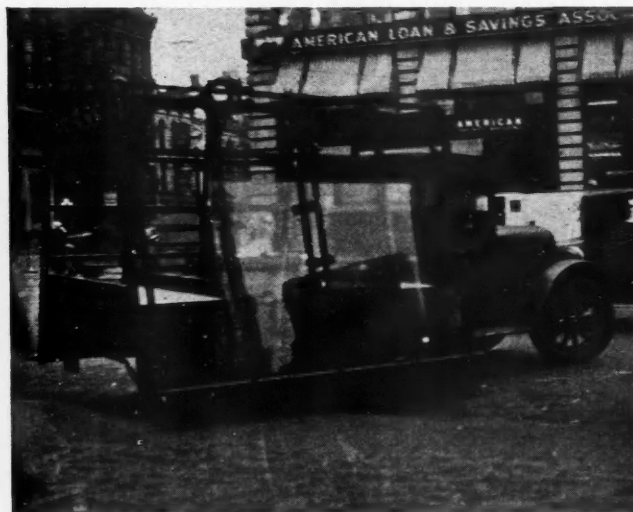
Above: Fig. 1—Convertible rack used exclusively for vertical outside carriage by M. Krakowitz Co., Philadelphia. Left: Fig. 2—A Providence glass dealer's combination body

THE truck certainly deserves considerable credit for the part it is playing in the glass distributing field. During the last 10 years architects and builders have been specifying more glass than ever before. Were it not for the truck with its special body equipment, the dealer's transportation problem, in view of this increasing glass demand, would be a very difficult and trying one.

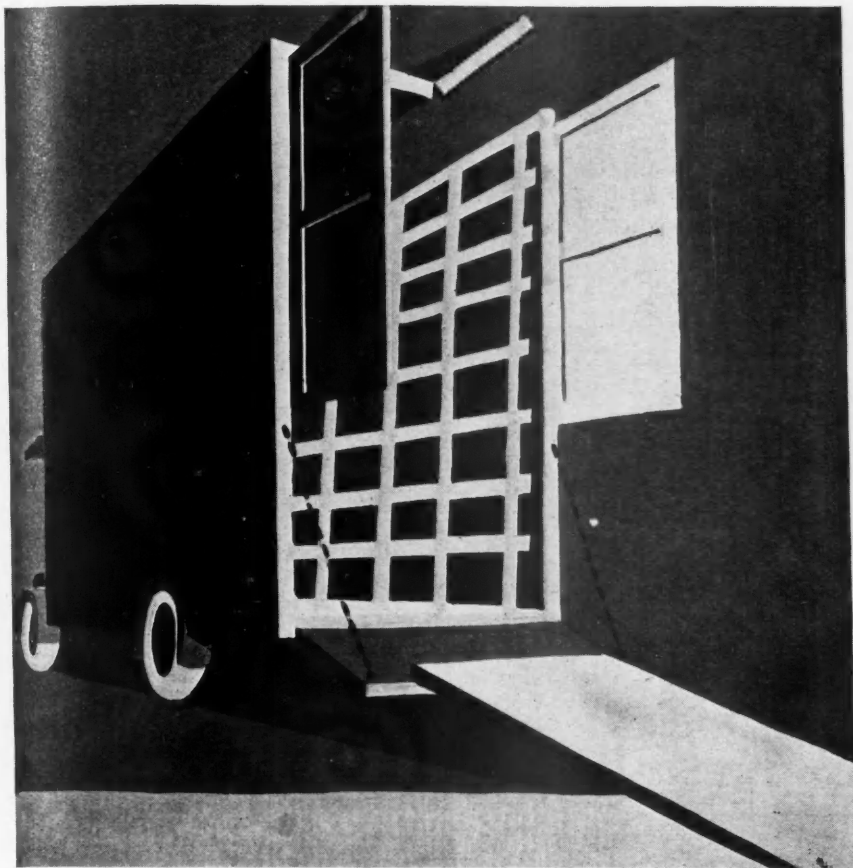
Carriage of large bulk glass, be-

cause of awkwardness in handling and liability of breakage, has been and still is a difficult and costly business. Formerly glass dealers of necessity had to carry large delivery crews, whereas today with special body equipment, quicker and better deliveries can be made with less men. Briefly, equipment available today provides rapid transit, greater insurance against breakage, relatively easier loading and unloading, permits the carrying of more

Left Below: Fig. 3—An A-frame body for carrying glass vertically on either side. Below: Fig. 4—Typical horizontal type body with rack supported on express sides



GLASS DELIVERIES

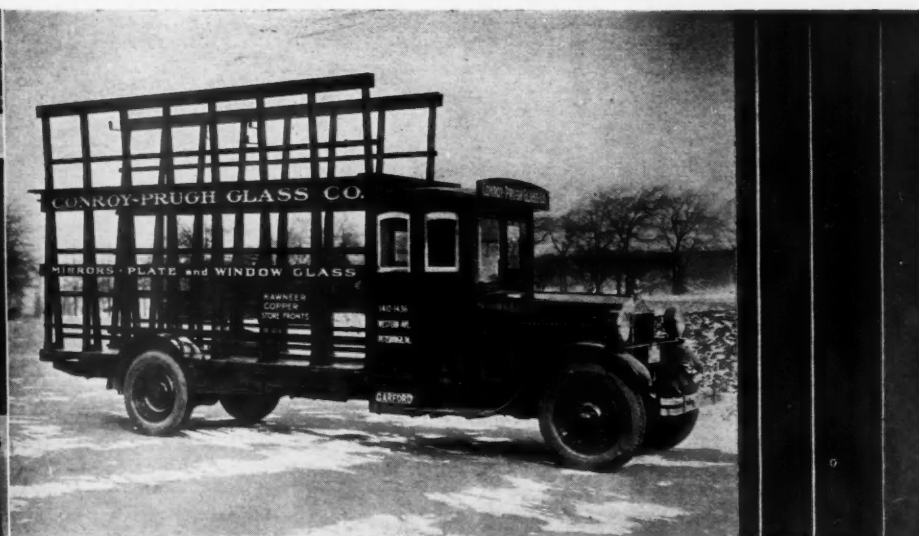


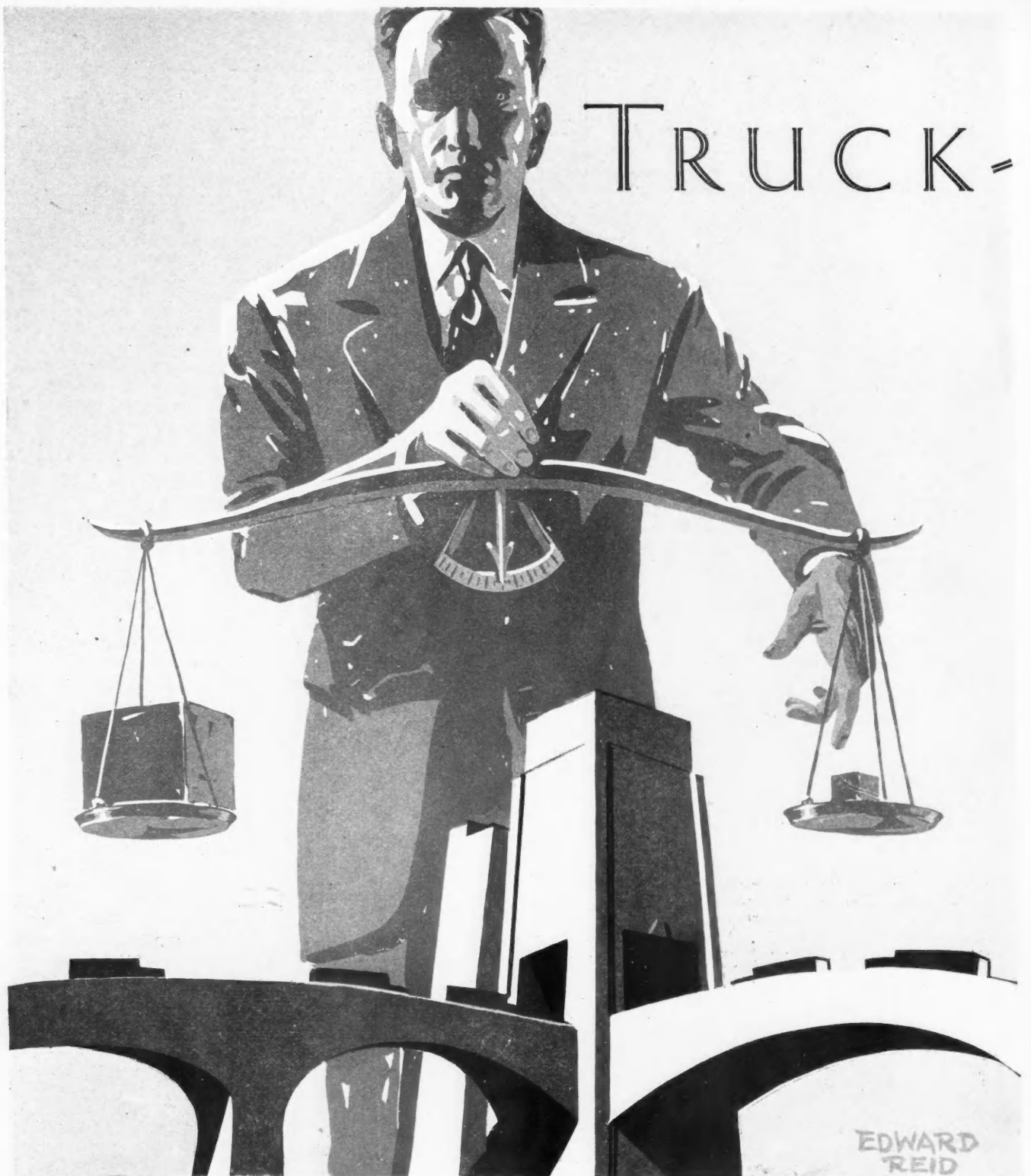
Below: Fig. 5—Typical inside vertical racks used by the Pittsburgh Plate Glass Co. and Conroy-Prugh Glass Co. As may be observed the general construction is similar. The method of assembling and joining the uprights and posts are the main differences

can be carried horizontally as well as vertically the former method is mostly confined to comparatively small sizes, because of difficulty in negotiating traffic congested areas and highway body-width restrictions. Vertical conveyance of large sizes allows greater flexibility in transit, does not infringe highway regulations and facilitates handling.

Both methods of vertical carriage have their advantages and disadvantages, but the advantages of the inside type seem to outweigh its disadvantages. While glass supported on racks outside of the body has the advantage of greater convenience in loading and unloading, due to greater accessibility and low ground clearance, dealers using vehicles for carrying glass on the inside believe that elimination of the breakage hazard encountered from curb or passing vehicles warrants some sacrifice in greater convenience in handling. Moreover, it is felt that outside carriage places severe side strains on the chassis, requires the services of a capable and strong-nerved driver, and limits the number of sheets that can be carried on one load.

The question of adopting the type best fitted to meet the needs of a particular glass dealer, however, depends upon individual conditions. For a small city concern, doing most of its business in the smaller sizes, or a concern located in a small town where the demand for large sizes is infrequent, an express type body designed to receive a horizontal rack would probably be most practical. Firms in large cities doing largely a replacement business may find that an express body with a removable outside vertical rack is more economical because side unloading is permitted at the curb, traffic difficulties are avoided and after delivery the truck is released for other services when the rack is removed. The convertible type, which consists of a rack that can be swung from a horizontal to a vertical position, (Turn to page 60, please)





THE adjustment of rates so that goods will move freely by motor and yet yield fair returns to the motor carriers is a difficult task. Motor carriers which use the classification system and rate structure of the railroad freight transportation service as a basis for motor rates must adapt the classification and rates to meet the peculiar needs of the motor transportation business.

The carriers using the Central Union Truck Terminal at Indianapolis

use the Official Classification as the basis for their rates. This classification is used also by the railroads serving this portion of Central Freight Association territory. In order to fit the regulations to their needs, motor carriers modify the provisions of the Official Classification in a number of respects by exceptions to the classification, published as parts of their rate schedules.

The exceptions discussed below may be regarded as typical of the changes

TERMINAL RATE STRUCTURE

The Sixth Instalment of the
Series on Cooperative Truck
Terminals

Cooperative Terminal Carriers Use
Modification of Official Classification
as Basis of Their Freight Rates

By G. Lloyd Wilson

Professor of Commerce and Transportation, University of Pennsylvania

made to adapt the Official Classification to the requirements of motor freight transportation service.

Order-notify or negotiable bills of lading are not accepted in connection with shipments of freight by motor carriers. Freight which is billed in this way when shipped by railroads must be forwarded as collect on delivery (C.O.D.) shipments when transported by motor freight service.

Articles of freight which exceed 15 ft. in length are not accepted for transportation unless they are accepted and receipted for as freight subject to delay for suitable equipment. If suitable equipment is not available freight of this size may be refused by the carriers.

Acceptance by the motor carriers of freight which requires protection against heat or cold does not obligate the carriers to provide refrigerator or heater trucks or trailers, nor trucks or trailers otherwise specially equipped to provide refrigeration or heating protective service. The carriers divest themselves of liability for spoilage in transit of perishable commodities requiring refrigeration or heating services.

Articles which because of their bulk, may not be rated at proper minimum rates upon the basis of their weights, are rated at special minimum rates based upon one-sixth of one cent per cubic foot of space per mile.

Articles of explosive nature and other dangerous articles, which are required under the provisions of the Official Classification to be transported under protection of the "Red Label," are not accepted for transportation by the motor carriers.

Many, in fact virtually all, articles are given separate class ratings when shipped by railroad in carload and in less than carload lots. The carload ratings are lower than the less than carload. The motor transportation rates are based

Motor Truck Freight Rates

Distance Rates

Distances Up to Two Hundred Miles

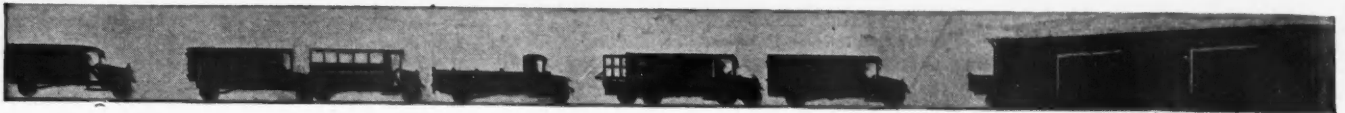
Base Miles Distances		Classes: Official Classification, Modified						
		1st	2nd	3rd	3 times 1st	2 times 1st	1½ times 1st	
		Rates in Cents Per One Hundred Pounds						
5 miles or less.....		29	24½	19½	87	58	43½	
5 " to 10 miles.....		31	26½	21	93	62	46½	
10 " to 15 ".....		32	27	21½	96	64	48	
15 " to 20 ".....		34½	29½	23	103½	69	52	
20 " to 25 ".....		36½	31	24½	109½	73	55	
25 " to 30 ".....		38	32½	25½	114	76	57	
30 " to 35 ".....		40½	34½	27	121	81	61	
35 " to 40 ".....		41½	35½	28	124½	83	62½	
40 " to 45 ".....		43½	37	29	130½	87	65½	
45 " to 50 ".....		46	39	31	138	92	69	
50 " to 55 ".....		47	40	31½	141	94	70½	
55 " to 60 ".....		47½	40½	32	142½	95	71½	
60 " to 65 ".....		47½	40½	32	142½	95	71½	
65 " to 70 ".....		49	41½	33	147	98	73½	
70 " to 75 ".....		50½	42½	33½	150	100	75	
75 " to 80 ".....		50½	43½	34	151½	101	76	
80 " to 85 ".....		52	44	35	156	104	78	
85 " to 90 ".....		53	45	35½	159	106	79½	
90 " to 95 ".....		53½	45½	36	160½	107	80½	
95 " to 100 ".....		54	46	36	162	108	81	
100 " to 110 ".....		56½	48	38	169½	113	85	
110 " to 120 ".....		58½	49½	39	175½	117	88	
120 " to 130 ".....		60	51	40	180	120	90	
130 " to 140 ".....		61½	52½	41	184½	123	92½	
140 " to 150 ".....		63½	54	42½	190½	127	95½	
150 " to 160 ".....		65½	55½	44	196½	131	98½	
160 " to 170 ".....		66½	56½	44½	199½	133	100	
170 " to 180 ".....		69	58½	46	207	138	103½	
180 " to 190 ".....		71	60½	47½	213	142	106½	
190 " to 200 ".....		72½	61½	48½	217½	145	109	

upon the less than carload railroad ratings and not upon the carload ratings provided by the Official Classification.

Unacceptable Articles

A number of articles which are accepted by the railroads for transportation must be refused transportation by the motor carriers because of the inherent nature of the articles or because of the limitations of motor transport facilities. A partial list of articles excluded by motor freight carriers, includes:

(Turn to page 54, please)



NEW TRUCK SALES

Complete Figures for April, 1929; Totals for

		Acme	American La France	Atterbury	Autocar	Brockway-Indiana	Chevrolet	Diamond T	Dodge Bros.	Fargo	Federal	Ford	G. M. C.	Godfredson	International	Larabee	Mack	Moreland	Pierce-Arrow	Relay	Reo	Republic	Rugby	Schacht	Selden	Sterling	Stewart	Studebaker	Whippet	White	Willys-Knight	Total Sales by States Including Miscellaneous		
ALA.	Apr.						390		28	1	3	282	14		59		1				5									3	8		798	
	4 mo.						727		56		6	610	28		98		4			1	14		1							7	14		1,566	
ARIZ.	Apr.						64		12	3		160	10		10						2									1	3		267	
	4 mo.						259		97	5		470	47		69		3	2			15		5					3	20	6	5	5	1,011	
ARK.	Apr.					4	240		21			356	4		87		2				6								1	4	7		737	
	May					1	193	1	22	1	2	317	5		46					12									2	1	4		612	
	4 mo.					1	672		87			1,085	31		194		2				29		2						2	14	22		2,150	
CAL.	Apr.	3			15	1	536	3	227	12	18	1,544	88	1	54		48	64	1		152	3	16			20	6	13	13	28	2	3,039		
	4 mo.	10	4		49	2	1,774	5	890	30	83	5,312	360	12	195		148	236	3	2	403	12	50			108	33	65	38	149	7	9,980		
COL.	Apr.				1	2	122		16	2	2	190	26		28					1	5								1	1	2		399	
	4 mo.				1	2	493		158	5	8	630	107	1	140					1	26	2	5						6	4	17	3	1,616	
CONN.	Apr.				20	14	247	3	111	9	9	318	54		52	2	49		4	1	70	1	3		1	4	20	10	3	15	3	1,039		
	4 mo.				25	25	609	8	230	25	16	720	94		105	4	103		9	3	168	2	5	1	1	5	44	24	19	27	5	2,277		
DEL.	Apr.				4		53		4			67	8		24					3		9		1						1	2		176	
	May				2		48		12			80	12		14					1		7		1						1	2		180	
	4 mo.				5	1	164		16			201	26		39		4			5	17	1	3						1	9		492		
D. C.	Apr.				2	4	45	12	11			84	7		2		10				7		2								4		191	
	May				1	5	61	6	15			138	9		4		11				6									2	6		282	
	4 mo.				4	6	151	21	23			320	20		15		17				11		2							4	8		609	
FLA.	Apr.						158	5				182	6		17		6		5		8									3	4		394	
	4 mo.				7		552	5	35	1	2	788	20		53		12		5		22	1							3	12	13		1,531	
GA.	Apr.				8		302	1	28	1	1	307	7		13		7				3								2	2	10		692	
	4 mo.					18	966	1	76	1	4	940	20		42		11				7								3	15	41		2,145	
IDAHO.	Apr.						71		8			51	3		9		1	10	1												4		158	
	4 mo.						141		31			168	9		36		9	10	1												6	1	429	
ILL.	Apr.	4		18	6	848	86	131	11	13	1	1,123	45	1	188		27			2	11	41	1	1		11	1	5	15	35	3	2,733		
	May	2		6	12	788	88	125	6	15	1	1,089	51		204		29			3	6	53	1	3		11	2	2	14	19	2	2,625		
	4 mo.	8		41	67	2,856	478	697	53	69	4	4,079	372	42	1,044		140		6	30	242	9	26		48	16	15	78	113	16		10,545		
IND.	Apr.				3	20	498	8	67	5	9	663	36		81		4			3	30		1	1				9	4	16	3	2	1,470	
	4 mo.				1	5	89	1,832	30	319	12	32	2,293	192		343		8		1	8	152		6	2			31	33	50	33	3	5,475	
IOWA.	Apr.					6	642	4	77	4	4	384	24		190		14			6	29		4						2	8	5	2	1,406	
	4 mo.				1	14	1,714	6	194	24	9	1,059	54		503		23			8	86	1	9						10	22	12	3	3,752	
KAN.	Apr.						1	404	7	55	4	2	371	34		113		1			19								5	9	2	2	1,033	
	4 mo.					3	1,127	12	221	13	2	1,059	105		313		4				55	2	1	1					13	37	14	7	2,989	
KY.	Apr.				6	8	254	6	42	2		245	24		53		8				10		1	3				1	4	7	6	1	684	
	4 mo.				6	17	678	14	128	8		699	87		163		17		2	7	55	2	4	7			1	11	22	18	1	1,947		
LA.	Apr.					16	192	7	15		1	270	10		25		2				2									2	5		549	
	4 mo.				3	17	650	13	88	2	5	962	40		116		9				10									7	22	1	1,945	
ME.	Apr.				2		241	4	45	2		304	13		9		1				30		1						5	8			665	
	4 mo.				3		416	4	63	2		538	16		16		2				46		3						8	9		1	1,127	
MD.	Apr.				11	2	214	7	38	2	2	319	31		39		26			1	26	4				5	3	2	3	14			762	
	4 mo.				3	34	6	588	24	130	2	16	822	79		85		84		6	78	5	1	1	12	17	3	7	46				2,019	
MASS.	Apr.	2	6		42	29	451	15	171	18	20	984	118		100	6	64		2		119	1	4	1	3	18	16	5	7	44	3	2,273		
	4 mo.	3	13		107	70	1,201	32	415	60	40	2,525	276	1	249	13	151		7	1	31	51	6	4	6	44	37	19	36	102	7	5,741		
MICH.	Apr.	3			3	18	892	6	110	9	23	1,411	103	1	152		11		5		89	5	7						7	24	7	4	2,922	
	4 mo.	23			18	22	2,636	31	392	54	75	4,178	281	13	353		35		13	3	284	6	18	1					21	66	45	13	8,581	
MINN.	Apr.						415	2	36	1	9	485	19		79		5			1	23		3						6	17	9		1,113	
	4 mo.						948	4	130	4	20	1,421	75		252		13		1	3	85		6						12	41	24	4	3,043	
MISS.	Apr.					4	226		15	1		255	7		24						4												1	539
	4 mo.					5	574		33	1		492	12		56						14											2	1,189	
N. O.	Apr.				5	20	706	33	116	4	12	744	73		148		19		28	2	32	1	3			6	3	7	20	11	1	2,042		
	4 mo.				16	49	2,263	129	431	17	72	2,374	264		484		71		28	3	136	10	13			11	4	26	97	48	1	6,547		
MONT.	Apr.						177		37	2	3	267	17		82						29									2	2	6	625	
	4 mo.				3		418		128	3	8	769	51		245		3		2		58	2	9						3	5	9	9	1,725	

† May not included in 4 mo. totals.

Figures in this table are compiled by R. L. Polk & Company, of Detroit, except Illinois, which is compiled by the New Jersey Motor List Co., New Car Division, of Trenton. Readers



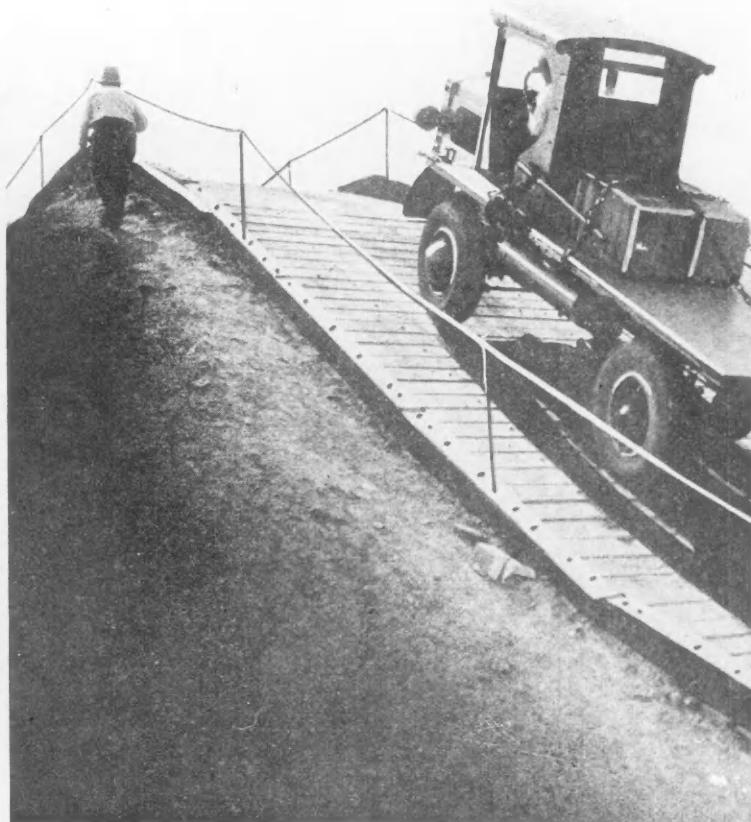
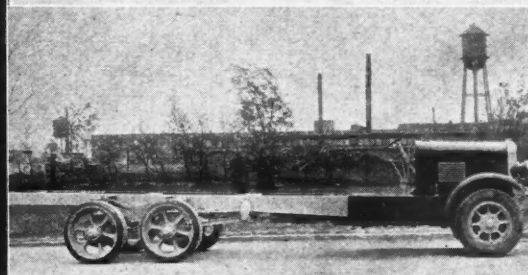
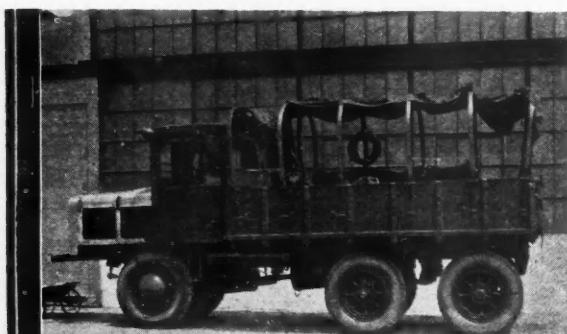
BY MAKES AND STATES

Four Months, and Partial Reports for May, 1929

		Acme	American La France	Atterbury	Autocar	Brockway-Indiana	Chevrolet	Diamond T	Dodge Bros.	Fargo	Federal	Ford	G. M. C.	Godfredson	International	Larabee	Mack	Moreland	Pierce-Arrow	Relay	Reo	Republic	Rugby	Schacht	Selden	Sterling	Stewart	Studebaker	Whippet	White	Willya-Knight	Total Sales by States Including Miscellaneous		
NEB.	Apr.					1	329	1	33			331	20	1	69		4				6		1					2	6	5		815		
	4 mo.					11	1,059	4	144	2	1	1,005	100	1	311		13				44		5					11	8	13	2	2,734		
NEV.	Apr.						20		14			44			2		1									1				1		87		
	4 mo.						79		64	2		153		7	12		2	7			2					1				5	1	336		
N. H.	Apr.					4	132		20		3	159	13		8		4				18							1	2	5	1	2	372	
	4 mo.					1	243	1	35	1	3	302	21		12		5				25							7	2	10	1	2	677	
N. J.	Apr.	1	6	28	37	579	15	137	21	24	711	57	1	44	1	100		9	2	69	2	9	5	2	14	5	13	20	38	3	2,020			
	May	1	5	25	16	440	5	79	9	14	565	48	2	46	1	46		1	3	56	2	5	2	10	7	12	9	25	6	1,488				
	4 mo.	3	16	74	83	1,620	29	273	48	65	2,134	192	5	145	3	247		41	7	198	2	16	9	6	29	22	43	68	111	14	5,503			
N. M.	Apr.					68		9	1		58	6		12							3		1						1	1		160		
	4 mo.				2	186		45	1	3	170	15		40							10		1						3	4		480		
N. Y.	Apr.	6	9	24	89	205	1,484	59	364	47	29	1,912	181	1	248	19	226		17	15	191	1	11	6	19	28	98	17	51	108	4	5,618		
	4 mo.	17	42	42	184	548	4,085	185	1,062	171	82	5,383	441	1	606	51	554		79	32	477	3	33	8	43	60	240	47	138	258	6	14,878		
N. C.	Apr.	4			6	2	471		49		1	354	20		24		11				8		3						1	7	6		981	
	4 mo.	14			11	8	1,437		217	4	6	1,340	98		83		30				29	4	8				3	6	25	13	1	3,337		
N. D.	Apr.					185		19			243	14		164							6		3						7	4	3	648		
	May					155		1	20		156	13		101							9		4						1	5	2	471		
	4 mo.					358		39		3	425	39		319							20		7						1	10	4	1,230		
OHIO.	Apr.	4			18	26	869	13	175	9	15	1,214	71	2	197		30		11	9	90	3	4	13	3	2	10	5	53	58	3	2,934		
	4 mo.	17			42	60	2,776	48	451	44	54	3,366	213	7	444		85		19	14	250	7	11	33	6	5	26	27	149	175	20	8,349		
OKLA.	Apr.				3	415	4	82	5	10	538	28		104		5		1	1	12	1				2				1	2	13	8		1,239
	4 mo.				26	1,269	18	290	21	30	1,584	87		310		26		1	2	66	1	2		12			8	11	47	30	1	3,842		
ORE.	Apr.					144	1	33	2	4	244	16		18		5	1				11		1						1	9		476		
	4 mo.					450	1	121	11	20	876	79		74		17	8				41	4	7						11	7	34		1,762	
PA.	Apr.	11	7	3	61	45	1,021	19	271	34	20	1,484	107	8	197	4	110		5	22	136	8	9	3	33	46	15	49	66	7	3,861			
	4 mo.	22	12	9	149	163	2,772	76	814	97	45	4,422	347	24	490	8	247		15	53	370	30	27	5	89	102	52	129	182	14	10,765			
R. I.	Apr.		1		10	1	82		29	3	4	96	15		13		7		1		35		1					6		5	1	313		
	4 mo.		1		26	2	216	1	104	8	12	267	45		30		18		2		79		3				13	1	5	11	1	845		
S. C.	Apr.	1				253		11	2	2	186	14		18							2											491		
	4 mo.	1			2	731		74	3	15	617	41		70		1					8		2					2	1	4	4		1,576	
S. D.	Apr.					88	1	11			69	6		59		1					15									2	2		254	
	May					131	1	18	4		137	10		84							18		3							1		1	412	
	4 mo.				1	319	6	59	1	1	379	31	1	253		6					38		7						6	1	5	1,114		
TENN.	Apr.				3	307	2	34		9	231	34		28		6					14								3	4	4	1	684	
	4 mo.				3	848	2	95	3	21	564	105		59		19					36	2							10	7	17	2	1,793	
TEX.	Apr.				12	22	1,605		135	7	6	1,421	75		286		12		1	1	39		5						9	9	21	3	3,685	
	4 mo.			2	29	49	3,961	27	437	31	20	3,989	245		837		48		3	21	160		19				4	24	44	83	7	10,04		
UTAH.	Apr.					61		17	1		100	3		9		2	1						1						1		6		204	
	May					52		8	1		86	1		5		1					6										2		168	
	4 mo.	1				177		56	2		332	10		41		12	2				9		4					4	2	11		663		
VT.	Apr.				1	71		11	3	4	119	12		37	3	2					19		1					1	2	2	2	1	291	
	4 mo.				1	161		44	7	10	259	27		69	4	4					34		1					3	7	4	6	1	642	
VA.	Apr.				4	9	400		28	1	5	327	10		26		12		1		10	1	2					1	2	3	5		848	
	4 mo.				9	21	1,074	4	128	2	24	1,215	59		121		20		1	1	54	16	7					8	4	15	32		2,815	
WASH.	Apr.					184		42	4	4	391	33		24		3	5	3		23	1	2							1	2	21		771	
	4 mo.					593		170	12	12	1,254	101		123		19	8	3	1	87	2	15						9	12	51	1	2,473		
W. VA.	Apr.	1			8	247	3	28	3	1	226	20		54		5	1	4	45	1	17		1					2	2	1	3		618	
	May				1	208	4	42		2	226	11		50		5	1	4	45	1	21	1									6	3	589	
	4 mo.	1			1	520	9	84	7	3	604	50		124		10		3	47		3	47		3	1				3	5	8		1,488	
WIS.	Apr.					738	25	62	3	14	897	39		136		5	1	4	45	1	3					15	9	5	9	15		2,056		
	4 mo.				1	1,357	69	174	16	39	2,029	97		269		14	1	7	46		50	3	5			42	28	16	23	23	9	4,318		
WYOM.	Apr.					34		19			69	1		10				1													5		141	
	4 mo.					81		69	1		166	8		26		1	1				6		2										361	
TOTAL	April	33	36	27	368	518	18,175	352	3,054	239	286	22,790	1,576	16	3,425	35	852	83	104	121	1,475	36	101	29	33	157	244	159	414	622	60	56,278		
Sales by Makes																																		

which is compiled by the Robinson's Advertising Service of Springfield; and New Jersey, desiring town and county lists of owners in any section may address any of these three companies.

TRUCKS PASS ARMY



Four of the six-wheelers shown at Holabird. At top: Army design, which incorporates gas-electric drive to front wheels and forward pair of rear wheels. Next below: Army mechanical drive with dual pneumatic tires. Next below: Twelve 38 by 9 in. pneumatic tires are used on this six-wheel Coleman with drive on all six wheels. At bottom: New Brockway-Indiana which embodies Timken tandem worm-drive rear axles, Continental, 16H six-cylinder engine and Brown-Lipe seven-speed transmission. Westinghouse air brakes are applied to four rear wheels and may be applied to front wheels, at extra cost

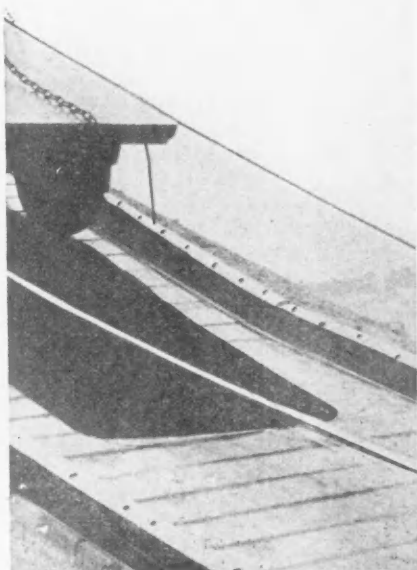
ANNOUNCED as an opportunity of showing "the suitability of standard commercial vehicles as replacement for specially designed and constructed army vehicles" the Military Transportation Pageant and Exposition arranged by Holabird Quartermaster Depot, U. S. Army, Baltimore, Md., June 12, 13, 14, brought together probably the most complete showing of special traction vehicles of recent years.

The program included a pageant depicting the development of transportation, an exhibit of trucks and component parts in a large factory-type building and tests in a field adjoining the exhibition building. Makers of conventional trucks as well as many types of vehicles adapted to traversing bad going exhibited their products and many of them also took part in the tests.

To no picnic were the trucks invited by the Holabird staff. A plank road built over an artificial knoll with grade increasing to 70 per cent near the top tested hill-climbing ability in terms of power, traction and weight distribution. A bit of new

TRACTION TESTS

Standard Jobs Show Up Well Under Gruelling Conditions at Camp Holabird. More than 45 Makers Exhibit



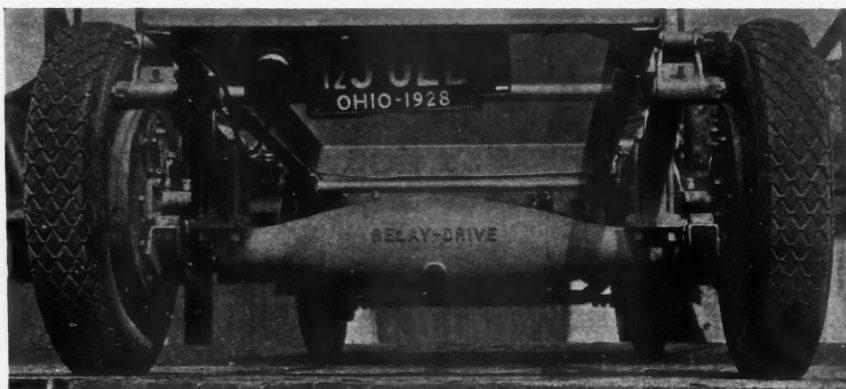
Severe tests were arranged by Holabird Quartermaster Depot. The Moreland, shown at top, is going over the frame distortion test, consisting of a staggered row of concrete humps. Below the Hug Roadbuilder is mounting the plank road on the artificial hill and at bottom a Christie Crawler, on a White, is pushing through deep mud



gravel and a plowed field called for traction, power and steering ability. A staggered row of concrete humps tested frame weave and flexibility of axle and drive assemblies. A glorified mud puddle labeled "30 in. deep" directed attention to ground clearance under front bumpers as well as under axles and springs—and traction too.

Graciously assuming the role of host, the Holabird Depot demonstrated three types of vehicles developed by the Army Quartermaster Department for traversing difficult terrain.

These included two different types of six-wheelers and a unit with steering front wheels and a rubber track crawler rear end assembly. Of the six-wheelers, one incorporated gas-electric drive to the front wheels and the forward pair of rear wheels, the rear pair of wheels being carried on an ordinary rear axle with the driving units omitted. The driven axles on this unit are of the double reduction gear type and the front axle drive is of the Coleman type incorporating universal joints within the wheels. The second six-wheeler embodied mechanical drive, front and rear, the four rear wheels being mounted on a sub-frame attached to the main frame. The drive on this vehicle is of the internal gear type, the front wheels being driven by a double beveled gear assembly, as in the Freeman truck. The rubber crawler type



rear end unit, used in the third vehicle, has V-type wheels in place of the regular wheels with another pair of V-wheels forward of the driving wheels. A large V-section rubber track circles the pair of wheels on each side. This construction is similar to that used in a Maccar truck which was described in April, 1928, issue on page 23.

Having shown that the hill could be surmounted without the vehicles sliding down or toppling over backward, a point which many in the crowd doubted, the Depot stepped aside and permitted the commercial trucks to show what they could do.

They did plenty. They went over the hill, wiggled over the frame distortion test blocks, traversed the new gravel and the plowed field, and squirmed through the mud puddle. A few, lacking that precise balance of power, traction and weight distribution, which is requisite for success in climbing very steep grades, failed. The mud puddle was almost impassable, as may be judged from one of the illustrations, but it too was conquered.

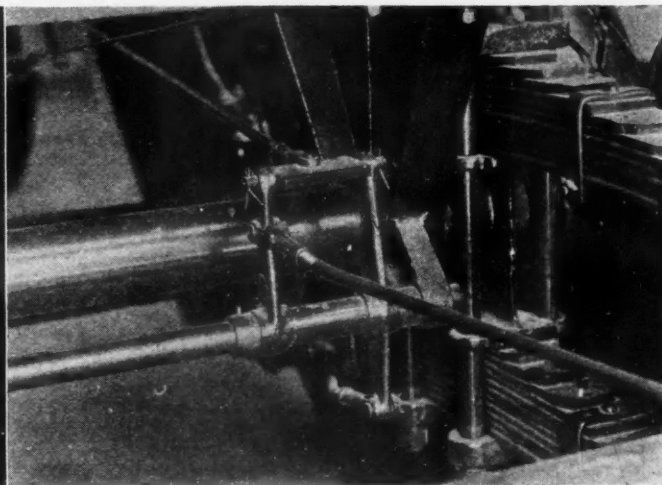
Of the trucks exhibited, a few incorporated features which obviously were inspired by the knowledge, or hope, that the U. S. Army would buy some trucks to supplement that seemingly inexhaustable supply of left-over world war equipment. Most of them, however, were designed for public utilities, contractors and others, who of necessity must cart material and do work on poor roads or across country.

Model 20 Relay axle differs from other Relay axles in the way the wheels are tied together. Two tubes extend from the brake spiders through the live axle housing to a point just outside the differential assembly where a crescent-shaped member ties the tubes together, permitting the entire spider, tube and crescent assembly to rock about the differential. Two short stub shafts act as stop for the Relay action

There were conventional two-wheel drive four-wheelers, unconventional two-wheel drive four-wheelers, four-wheel drive four-wheelers, several different combinations of four-wheel drives on six-wheelers, six-wheel drive six-wheelers, crawlers of steel and rubber on standard trucks, a crawler type tractor-truck, an eight-wheeler and a 10-wheeler.

Four-wheel drive was shown on four-wheel trucks, in several different combinations on six-wheel trucks and on the eight-wheel Versare, in the commercial group. In the four-wheel drive four-wheeler group were FWD, Coleman, Walter and Freeman. In the four-wheel drive six-wheelers Diamond T, Brockway-Indiana, Maccar and Moreland exhibited trucks with drive on the four rear wheels. FWD incorporated four-wheel drive in a six-wheeler, with drive on the front

Below, at left: A flat leaf-spring type radius rod is used on the Omort road truck. At right, solid steel shaft forms extra axle on FWD six-wheeler



wheels and the forward pair of rear wheels, the extra rear wheels being mounted on a dead axle in the rear of the driven rear wheels. The Dual Duty Co. demonstrated its attachment for Ford AA trucks in which an extra pair of wheels is placed ahead of the regular axle and driven by chain from the standard Ford rear wheels. Crawler type rear end assemblies incorporating steel tracks and rubber tracks, which may be attached to standard trucks, were shown by Christie Crawlers, Inc.

The Linn tractor, a heavy-duty unit with steel crawler rear drive and an accompanying crawler type trailer, were exhibited. The tractor was demonstrated in the mud course, even towing other vehicles through the mud.

Gas-electric drive is used in the eight-wheel Versare truck, shown by the Cincinnati Car Corp. This truck incorporates two four-wheel bogies, each of which is made up of a rear axle driven electrically and a front axle with wheels which steer. This truck made very sharp turns to the right and left and figure 8's.

Two unconventional multi-wheeled vehicles were the Browning-Christie 10-wheeler which has drive on eight wheels, four in a group on each side of the frame, arranged like a roller skate and another vehicle which had a row of tires across (Turn to page 58, please)

STUDEBAKER 1-TON HAS TWO-BODY CHOICE

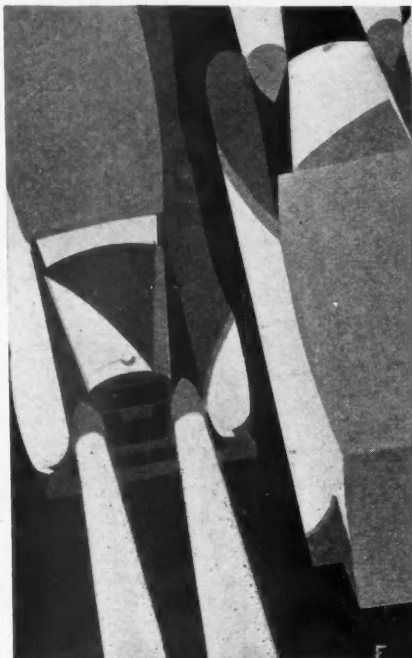
Panel or Screen Type Bodies Are Available With New Six in 8 and 9 ft. Lengths

A NEW 1-ton, 146-in. wheelbase truck chassis powered by a 75 hp. six-cylinder engine and priced at \$1,095 has been announced by the Studebaker Corp., South Bend, Ind. Panel or screen bodies in two capacities are available with this new unit; one is 8 ft. long with 155.3 cu. ft. of loading space, listing at \$1,525, and the other is 9 ft. long, provides 181.3 cu. ft. of floor area and lists at \$1,575.

Bodies are equipped with tilting and adjustable seats with a removable seat alongside the driver, permitting when necessary the delivery of extra long packages.

Floors are 27 in. from the ground, rear doors are 47 in. wide and fitted with ventilating louvers, and front doors are 35 in. wide. Dome lights provide interior illumination.

The 3½ x 4½ in. powerplant, giving a piston displacement of 248 cu. in., is equipped with a semi-automatic choke control to prevent over-choking and to reduce crankcase dilution. Manifold heating is controlled from the dash for seasonal variation in temperature. An oil filter and crankcase ventilator are



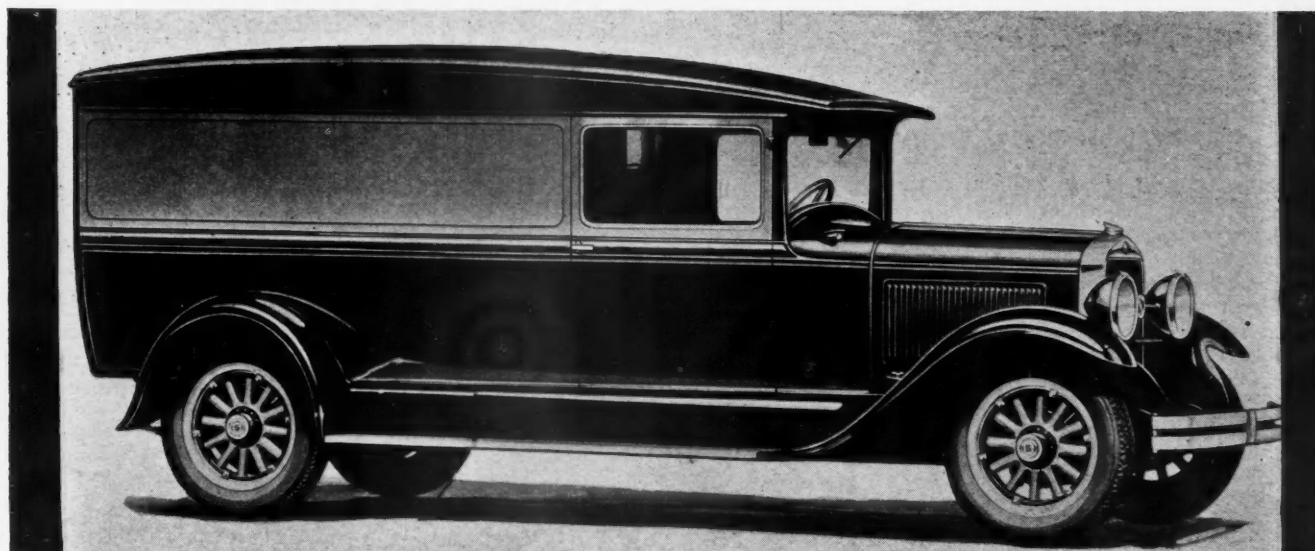
standard equipment. The transmission line includes a single plate clutch fitted with a torsional vibration damper, a four-speed transmission with case hardened gears, Spicer balanced tubular propeller shaft, and a Clark semi-floating, bevel drive rear axle. Timken bearings are used at the differential and Timken tapered roller bearings at the wheel hubs. Four-wheel mechanical operated Bendix brakes are fitted. Frame channels have a depth of 6 in.

Equipped with a stock 8 ft. panel body Studebaker's new 1-tonner lists at \$1,575

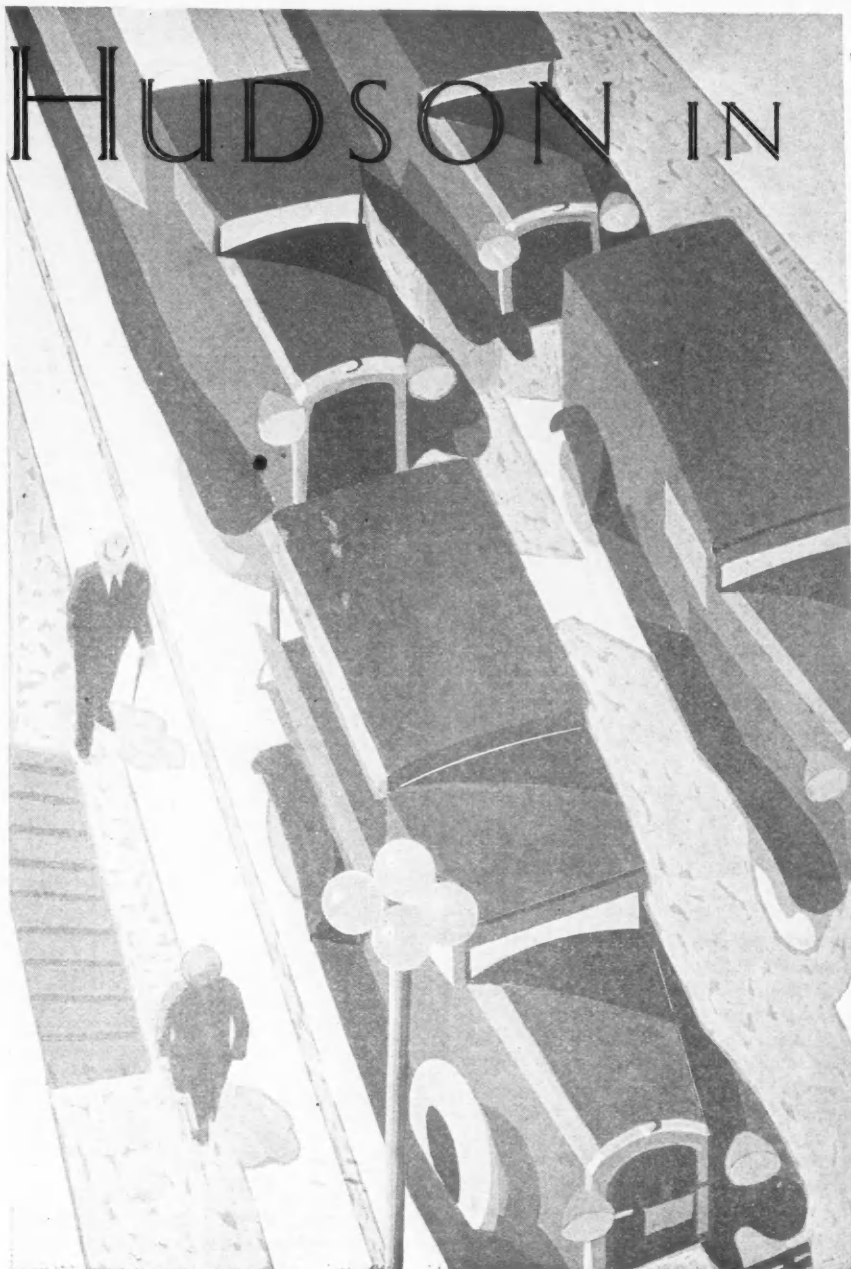
Specifications of 1-Ton Studebaker

Model	1 ton
Chassis price	\$1,095
Wheelbase	146 in.
Tires	30 x 5 in.
Engine, size	6½ x 4½ in.
displacement	248 cu. in.
hp. @ 2800 r. p. m.	75
valve arrangement	L-head
valve intake diameter	1½ in.
exhaust	1½ in.
number of main bearings	4
Crankshaft diameter:	
first	1 15/16 in.
second	2 in.
third	2 1/16 in.
fourth	2¼ in.
piston material	cast iron
compression ratio	5 to 1
Oiling system	full pressure
Front end drive	gear
Carburetor	Stromberg
feed	AC pump
Ignition, make	Delco-Remy
type	battery distributor
Generator and starter	Delco-Remy
Gasoline tank capacity	18 gal.
Radiator, type	fin and tube
temperature control	thermostat
Clutch, type	plate
Transmission, speeds	4
mounted	unit
Universals	3-Spicer
Propeller shaft	double
Rear axle, make	Clark
final drive	bevel
type	½ floating
ratio	4.64 to 1
Drive and torque	springs
Steering gear, make	Ross
type	cam and lever
Service brake	4-wheel Bendix
drum size	15 x 2¼ in.
Hand brake, location	transmission
Springs, size, front	38 x 2 in.
rear	50 5/8 x 2½ in.
Frame	6-in. channel
Wheels	wood
Chassis lubrication	Alemit

and are assembled with four tubular and two pressed steel cross members. A hydrostatic gasoline gage is included as standard equipment. Detailed specifications are given in the accompanying box.



HUDSON IN TRUCK



Passenger Car Company Enters Light Duty Field With $\frac{3}{4}$ -Ton Vehicle in Four Body Types

By Athel F. Denham

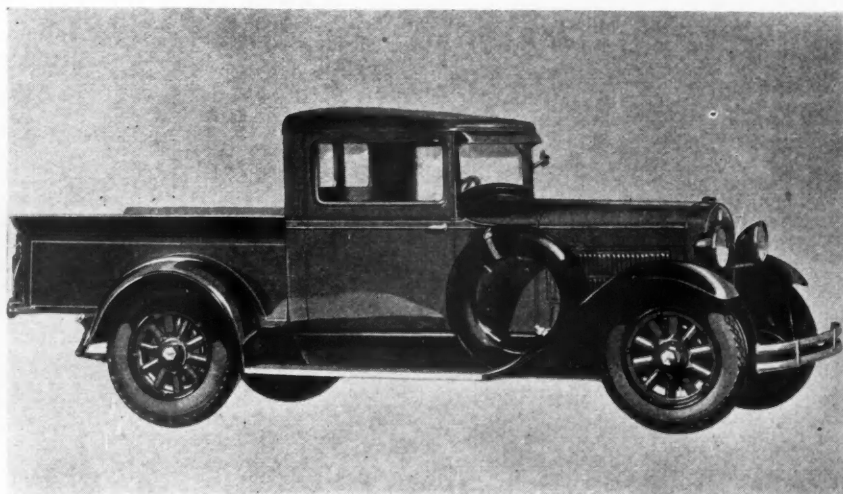
Below and on opposite page: Views of stock bodies available with Hudson's new $\frac{3}{4}$ -ton Dover. List with open express is \$835; with canopy express \$870, and with panel express, \$895

On the page opposite to this at upper right is a cutaway view of the right side of the Dover engine

THE entry of the Hudson Motor Car Company into the light truck field, announced as impending in these columns some time ago, has become a fact with the announcement by this company of the Dover, a $\frac{3}{4}$ -ton commercial car in four body types. Chassis list price is \$595, with the prices for body models as follows: Open express, \$835; canopy express, \$870; canopy screen express, \$885, and panel express, \$895.

The new Dover is featured by a six-cylinder, relatively high-speed engine. Exteriors, as will be noted from the illustrations, are quite striking, with an especially pleasing front end treatment, similar in lines generally to the Hudson and Essex passenger cars.

Of the mechanical details, the engine has a bore and stroke of $2\frac{3}{4}$ by $4\frac{1}{2}$ in., giving a piston displacement of 160.3 cu. in., an N.A.C.C. rating of 18.2 hp., with an actual power development of



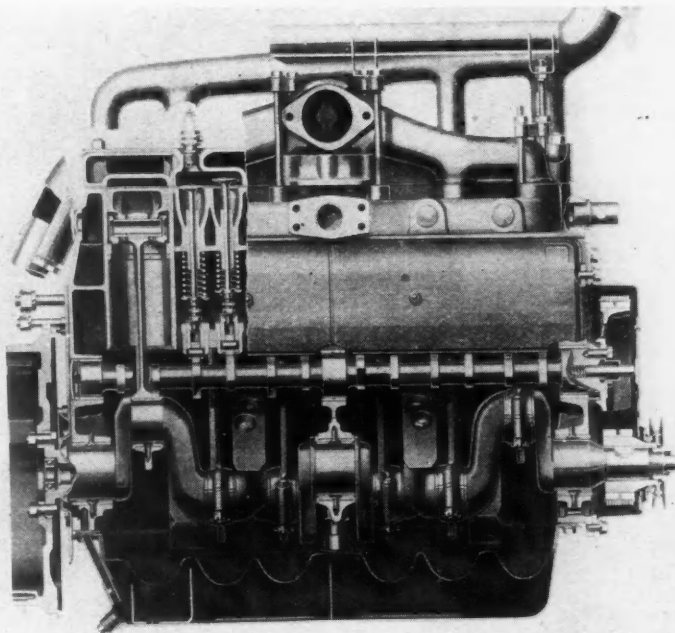
FIELD WITH DOVER

55 hp. at 3600 r.p.m. Most of the engine replacement parts are interchangeable with those of the Essex Super Six, so as to keep down dealers' stocks of parts and keep down the cost of servicing to a minimum.

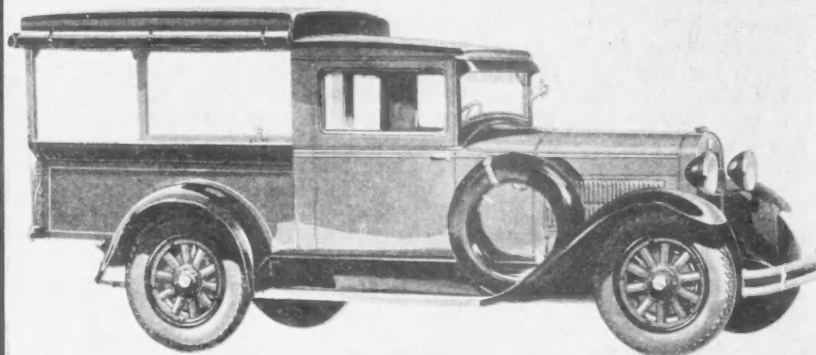
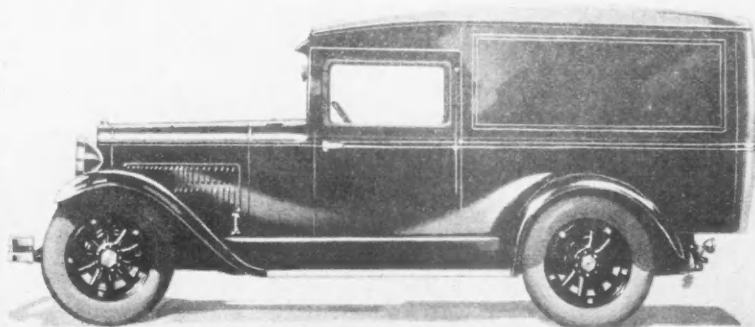
The carburetor is a 1½ in. air valve type Marvel provided with automatic heat regulation by interconnection of a butterfly heat control valve with the throttle. An adjustment is provided for varying temperature and an accelerating well for winter operation. The manifold is water jacketed. Combustion chamber design is such that incoming gases are directed over the exhaust valve before entering the chamber proper, resulting in cooler valves. The spark plug is located near the exhaust valve. Scavenging of the portion of the chamber over the intake valve, which in effect is recessed, is aided by a considerable overlap in the valve timing. To insure adequate fuel supply at open throttle a booster is used in connection with a Stewart-Warner fuel tank, which also incorporates a fuel strainer.

Other features include a large capacity oil pump, a full double bottom crank pan for easier cleaning, ventilation through the valve chamber and

front end cover. The engine is carried in rubber-mounted bushings at four points. Lubrication is of the combination
(Turn to page 56, please)



4556-S



Specifications of ¾-Ton Dover

Model	Dover
Chassis, price	\$595
Capacity	¾ ton
Wheelbase, standard	110½ in.
Tires, front	5.00/20
Rear	5.50/20
Engine, size	6-2¼ x 4½ in.
Displacement	160.3 cu. in.
Hp. at 3600 r.p.m.	55
Valve arrangement	L-head
Number of main bearings ..	3
Piston material	Aluminum
Compression ratio	5.75
Suspension	4-point rubber
Oiling system	Splash
Front-end drive	Chain
Carburetor, make	Marvel
Feed	Vacuum
Ignition, make	Auto-Lite
Type	Battery auto-matic advance
Generator, and starter	Auto-Lite
Gasoline tank, location	Rear
Capacity, gal	11½ gal.
Temperature control	Shutters
Clutch, make	Own
Type	Single plate
Transmission, make	Own
Speeds and mounting	3-unit
Universals	Spicer-metal
Rear axle, make	Own
Final drive	Bevel
Type	Semi-floating
Ratio, standard	5.6 to 1
Drive and torque	Springs
Steering gear, make	Gemmer
Service brakes	4-wheel
Type	2-shoe Bendix
Size of drum	11 x 1½ in.
Hand brake	4-wheel
Springs, front	36 x 2 in.
Springs, rear	53¼ x 2 in.
Frame	8 in. channel
Body dimensions:	
Inside height	50½ in.
Inside width	50¼ in.
Distance seat to rear door ..	43 in.
Distance dash to door	72 in.
	121 11/16 in.

AFTER

Title Paleontologist, entomologist and horologist—to mention only a few, well-known “ologists”—are impressive titles. In fact to some they may be so high-sounding as to drown their meanings. But the “ologist” tends to put you over much more prominently with the voters than if you styled yourself plainly as a fossil student, bug student or watchmaker.

At least that's the way a Brooklyn truck operator must have figured. He doubtless came to the conclusion that to advertise himself as a hauler neither impressed his public nor conveyed to it his ability to study a transportation job and do it with efficiency and economy. So he advertises himself as a “truckologist.” And while to most haulers this is a good belly-laugh, we can't get rid of the idea that it's a good stunt if, like a lot of stunts, it isn't overworked.

Rating

The general public is gradually coming to a conclusion which truck users and sellers arrived at long ago, to wit: That a manufacturer's capacity rating is not necessarily the limit of a truck's efficient carrying capacity. Where is the truck salesman who hasn't sold, say, a 2-ton truck with assurances to the purchaser that it will safely carry a 3-ton load; and how many truck owners are there who even without such assurances haven't overloaded their vehicles at least 50 per cent above the factory rated capacity?

The State Tax Commission of Kentucky recognized this state of affairs a few months ago by issuing an order increasing capacity ratings on motor trucks 50 per cent above the manufacturers' ratings and decreeing that trucks would be taxed on the basis of the increase. In the courts the commission's order was, of course, reversed because the manufacturer's rating is the legal standard for truck taxation and must be adhered to until another standard is substituted. The Kentucky litigation, however, made the public more conscious of truck overloading than it has ever been and it's almost a sure bet that the Kentucky Legislature before long will change the taxation standard.

As of Jan. 1, 1929, 13 states compute registrations by the gross weight method, which includes chassis weight and chassis carrying capacity. With the public becoming more and more convinced that the capacity ratings of



most truck makers are not the efficient load limits of their vehicles, it is a certainty that other states will adopt the gross weight method of taxation.

The purposes of our comments here are to make the truck trade and operators conscious of the trend of public opinion and to urge that in the 28 states using the capacity method of taxing trucks the proper groups get together, frame their own taxation method and work aggressively for its adoption. There's truth in the common saying that it's easier to get the right kind of law passed than it is to get the repeal of an unfavorable law.

Memo

truck buying.

Being aware of this, many successful truck dealers promote their business by going after prospects in the proper seasons. In the fall they put their salesmen on the trail of coal dealers and in the spring and summer they lay special stress on the promotion of

HOURS

farmer, creamery and truck garden business. And so on. They have their prospects' buying seasonally reckoned, and work on them hardest when they are most likely to purchase.

Spring, summer, fall and winter are more than just seasons to the men selling trucks. If they aren't, experience teaches they should be.

Action

The great need and incalculable value of coordinated action among motor truck associations in preventing obstructive truck legislation was forcefully demonstrated about a month ago.

A bill was introduced in the Illinois Legislature requiring non-resident truck owners to purchase Illinois state truck license plates before being permitted to use the Illinois highways. The Motor Truck Owners Association of Illinois made every possible effort to prevent the passage of the bill but the special interests back of it were determined.

In this extremity the association of Motor Truck Association Executives of America was appealed to and those responding to the call to arms were representatives of truck associations in the nearby states of Minnesota, Kentucky, Iowa, Ohio, Indiana and Missouri, and several members of the National Furniture Warehousemen's Association. Their spokesmen so impressed certain members of the committee considering the legislation which would have most certainly precipitated another border license plate war, that the bill was killed.

The Motor Truck Association Executives of America deserve compliments.

Exports

While truck production and domestic truck sales have broken all records so far this year, the export market has also proved a boon to manufacturers who have been wise enough to play ball with the foreign market. In fact, if truck exports continue to increase as they have in the last several years, the foreign field will shortly equal the domestic market in sales. This unprecedented condition seems to be just around the corner because in the first five months of this year 44 per cent of total truck production was exported. Tariff complications are the only thing likely to scramble the outlook. G. T. H.

Ten Reasons for the Record-Breaking Popularity of the Six-Cylinder CHEVROLET TRUCKS

for Economical Transportation



In every section of the country, the new Chevrolet Six-Cylinder Trucks are sweeping ahead to one of the greatest records of success in the history of the commercial car industry—for these sensational new trucks meet, with unusual efficiency, the problems presented by crowded traffic conditions and modern ideas of prompt customer service.

They provide the remarkable flexibility, acceleration, speed and reserve power of the six-cylinder engine—with body types specifically designed for every business need. They afford outstanding economy of operation—and are actually available in the price range of the four!

Read, in the column at the right, the ten big reasons why truck users everywhere are turning to Chevrolet. Then get in touch with your Chevrolet dealer—and arrange for a trial load demonstration!

CHEVROLET MOTOR COMPANY, DETROIT, MICH.
Division of General Motors Corporation

The Sedan \$595 The Light Delivery \$400 The 1½ Ton Chassis \$545 1½ Ton Chassis with Cab \$650
All prices f. o. b. factory, Flint, Michigan

A SIX IN THE PRICE RANGE OF THE FOUR

1 Six-Cylinder Power—that carries full capacity loads up the steepest hills with abundant reserve power—plus the adaptability of a four-speed transmission, with power take-off opening on the 1½ ton truck.

2 Six-Cylinder Speed and Acceleration—that permit the servicing of wider areas, and the completion of more trips—whether in city service or suburban usage.

3 Six-Cylinder Smoothness—that protects the entire truck from the destructive effects of undue vibration and affords exceptional comfort to the driver even on the longest trips.

4 Remarkable Handling Ease—that results from a full ball bearing steering mechanism; big, non-locking four-wheel brakes; and a remarkably smooth transmission.

5 Amazing Economy of Gasoline and Oil—due to such advanced engineering features as hot-spot manifold, automatic acceleration pump and crankcase breathing system.

6 Outstanding Dependability—achieved by thoroughly tested construction in every unit—from the rugged rear axle to the large-capacity, highly efficient Harrison radiator.

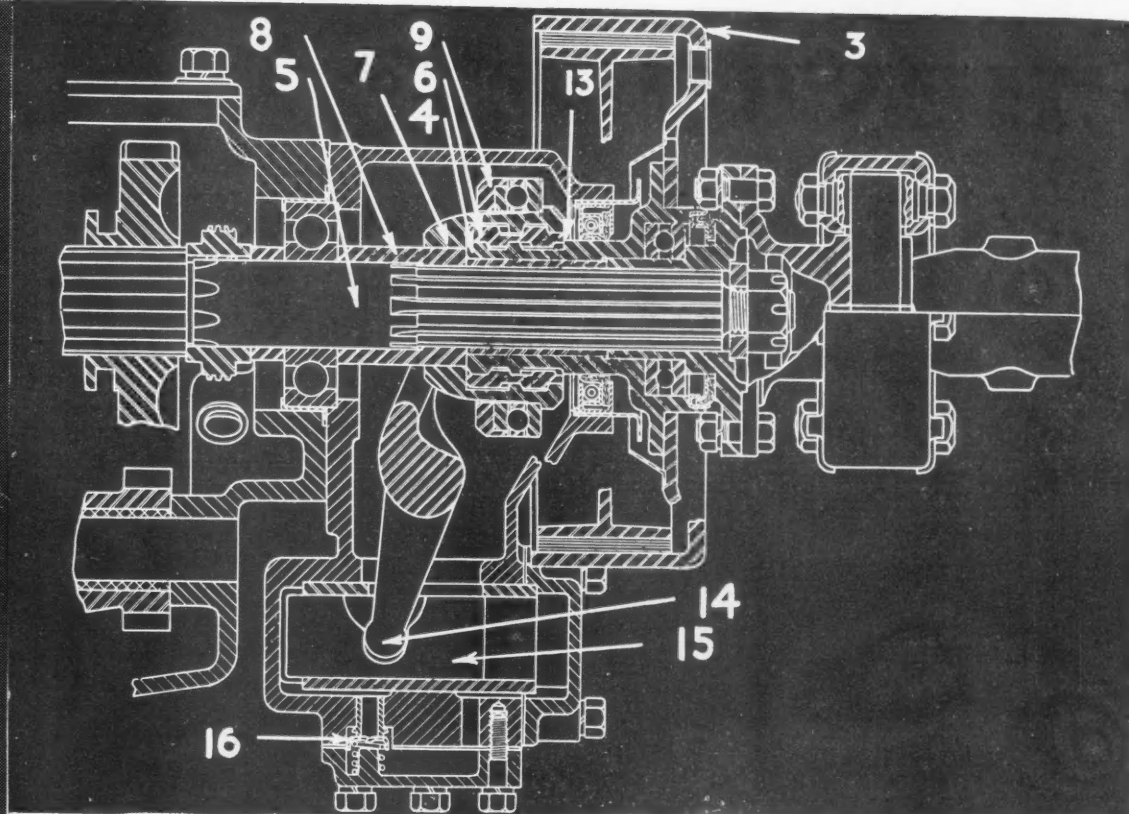
7 Extremely Economical Service—provided by 10,000 Authorized Chevrolet Service Stations, operating under a low flat-rate system of charges.

8 Ample Capacity—made possible by a heavy channel steel frame, with sufficient frame length to permit the mounting of unusually large bodies without extensions.

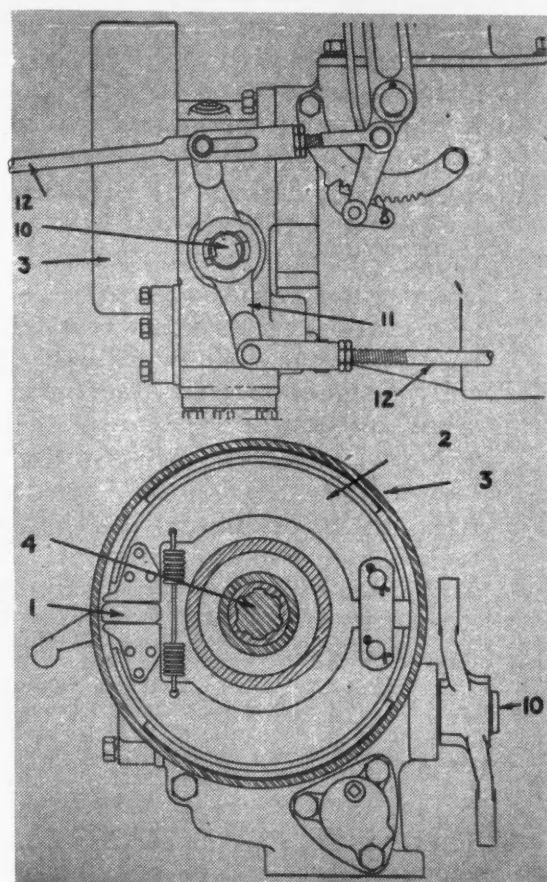
9 Wide Selection of Body Types—that make Chevrolet Trucks adaptable to every line of business. And among them is one designed especially for your requirements.

10 Amazing Low Prices—that make Chevrolet Trucks the biggest values ever offered—combined with the lowest available financing charges for those who desire to buy on easy terms.

STEWART-WARNER



APPLICATION of the brake pedal operates the power unit cam 1 and expands the shoes 2 against drum 3. This drum is integral with the hub 4. While both the drum and hub are mounted so that they can rotate on shaft 5, they are indirectly connected to the shaft through a two-way spiral member 6 and collar 7 to a straight splined member 8, which is keyed to the transmission shaft. Upon applying the brake pedal when the car is moving forward, the rotation of the drum is retarded in relation to the drive shaft. This retardation causes the spiral member 6 to screw outward together with the collar 7, which is splined on member 8. Mounted against a shoulder on the collar member is a thrust bearing 9, against which a yoke bears as the collar moves outward. Keyed to the yoke shaft 10 is a brake applying lever 11, which is connected by pull rods 12 to front and rear wheel camshafts. When the car is moving backward, the reverse spiral on member 6 comes into play. Since the reverse spiral tends to move member 6 to the right, and this movement is prevented by abutting the right end against the shoulder on the drum hub at point 13, collar member 7 moves to the left as before, and, of course, moves yoke shaft 10 against bearing 9 with it. To hold the brake linkage in the brake applied position during successive and repeated braking applications, an arm 14 on yoke shaft 10 is connected to a dash-pot. Arm 14 is extended into a recess in plunger 15. Pressure exerted by the arm and plunger against oil in one side of the cylinder casing, the oil to flow through the by-pass valve 16 to the other side, provides the necessary resistance. When the brake is released, no resistance is offered the oil in its flow back to its original chamber. The hand-operated brake operates the same wheel brakes, and is connected by a clevis to the upper end of the lever 11.



BRAKE USES MOMENTUM

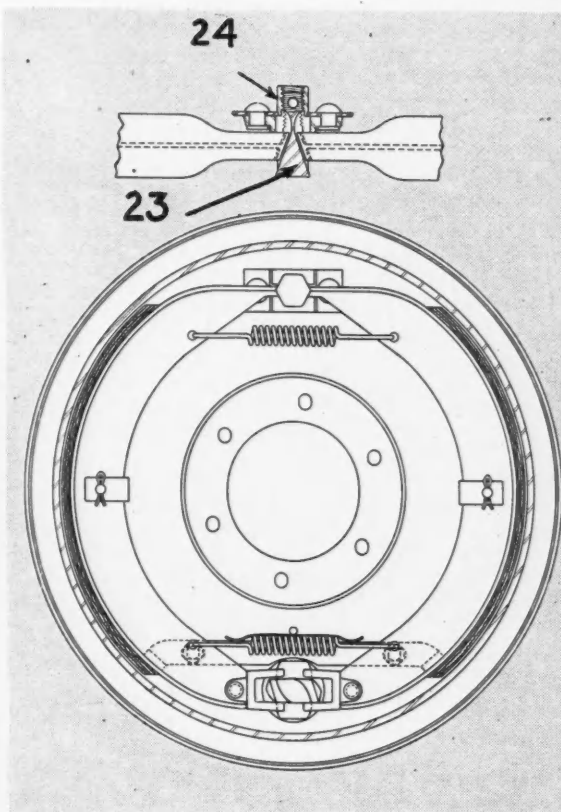
Transmission Mounted Brake Amplifier and Two-Shoe, Wedge Adjusted Internal Brakes Comprise Four-Wheel System

STEWART-WARNER announces a complete four-wheel mechanical braking system, comprising two-shoe wedge adjustable brakes at the wheels and a two-shoe power amplifying unit built in the rear of the transmission. This unit obtains power from a drum mounted on the transmission shaft, and when the shoes of this drum are expanded by application of the brake pedal, a member operating on a spiral sleeve is moved forward, applying the wheel brakes through pull rods. The system is being offered to car manufacturers for adoption on cars of large production.

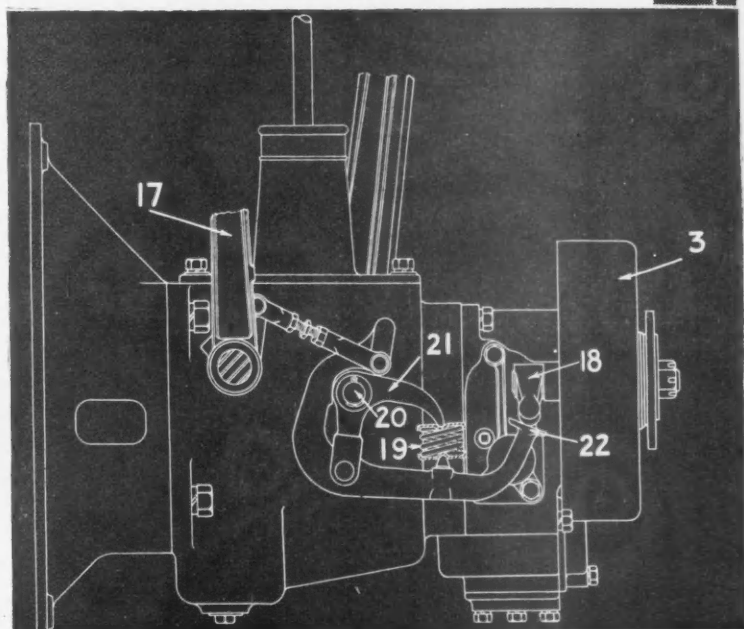
Brakes and operating cross-shafts are assembled on the front and rear axles as complete units, and only two rods are necessary to connect the brakes with the power unit. With the exception of the camshafts, all parts are interchangeable between front and rear. Cams are large and the shafts rigid, requiring very little angular travel of the linkage to compensate substantial wear on the brake lining.

Because of the shift of center of gravity during braking, more force is applied to the front wheels than the rear. This is accomplished without over-applying the front brakes by actuating them by an increased travel of the rods rather than by equalizers or different leverage. Because of the increased force taken by the front wheels and sufficient travel provided in the linkage, wear in all four wheels is evenly distributed.

To prevent the linkage from being taken up too abruptly,
(Turn to page 54, please)



DETAILS of the Stewart-Warner wheel brake. As may be observed, these are of the two-shoe, non-wrapping type. There is one adjustment for each wheel, consisting of the wedge 23 and nut 24, by means of which the anchored ends of the shoes can be moved farther apart as the lining wears. Range of adjustment is sufficient to take care of maximum wear on $\frac{1}{4}$ in. brake lining. Adjustments are facilitated by audible clicks. Each click represents approximately .004 in. movement of the shoe anchor and corresponds to approximately .002 in. at the point of shoe contact, midway between the anchor and the operating cam.



TO permit a more gradual increase in the pressure applied to the power unit with pedal travel, a pedal modulator linkage can be provided between applying lever 17 and the power unit cam lever 18 if desired. When the pedal is depressed, the effect is that of a simple lever acting around fulcrum 20, and the clearance between the shoes and the drum of the power unit is quickly taken up. Thus the brakes are applied almost immediately. Continued movement of the pedal compresses the spring 19 and increases pressure on power unit shoes at a rate depending on the characteristics of the spring 19. Intermediate lever 21 will swing around fulcrum 20, with the result that the contacting face 22 of the primary lever will slide along the end of cam-operating lever 18. When the modulating spring is fully compressed, the effect is again that of a simple lever. The contact surface is at such an angle that it will stabilize the sliding effect and cause the proper release as the pedal is returned.

FLAT RATE PRICE LIST

NUMBER 31

REO TRUCKS

Springs

2. Clip (U bolt) front, renew one.	
F-4	\$0.90
T-6	0.75
Jr.	0.75
FA, FE, FF	1.10
G models	1.10
2b. Clip (U bolt) rear, renew one.	
F-4	1.30
T-6	1.10
Jr.	1.10
BA, BC	1.10
FA, FE, FF	1.10
G models	1.50
3. Tighten all U bolts and adjust side play on all shackles.	
F-4	2.70
T-6	2.25
Jr.	2.25
BA, BC	2.25
FA, FE, FF	2.75
G models	2.75
4. Renew all spring and bracket, bolts and bushings on all springs.	
F-4	\$9.40
T-6	8.80
Jr.	8.80
BA, BC	8.80
FA, FE, FF	9.75
G models	9.75
5. Center bolt front, renew.	
All models	1.75
5b. Center bolt front renew, when spring is off.	
All models	1.10
6. Center bolt rear, renew.	
F-4	2.75
T-6	2.25
Jr.	2.25
BA, BC	2.25
FA, FE, FF	3.00
G models	3.00
7. Spring, front, remove and replace or renew one.	
F-4	2.75
T-6	2.75
Jr.	2.75
BA, BC	2.75
FA, FE, FF	3.50
G models	3.50
8. Spring, rear, remove and replace or renew one.	
F-4	4.70
T-6	3.50
Jr.	3.50
BA, BC	3.50
FA, FE, FF	4.65
G models	4.65
8b. Remove rear spring, disassemble, replace parts required, reassemble and reinstall.	
F-4	5.00
T-6	4.50
Jr.	4.50
BA, BC	4.50
FA, FE, FF	5.00
G models	5.00

NOTE

Reo prices in this table supplement those in price list numbers 23, 24 and 25, and supersede the spring prices in list 17 for models F4 and T6.

Prices are furnished for the four-cylinder F4, the six-cylinder T6, the Junior Speedwagon, 1-ton DA and DC, 1½-ton FA, FE and FF, 2-ton FC and FD, and 3-ton GA, GC and GD.

Additional Reo prices will be given in an early issue.

Rear axle operation prices are given for FWD trucks. These prices supplement rear axle prices given in price list number 27.

9. Replace rebound clip.	
All models	0.60
10. Replace tension plate on front spring.	
BA, BC	1.30
FA, FE, FF	1.25
GA, GC	1.25
11. Renew rubber spring mountings on front and rear springs.	
Jr.	16.00

Fenders, Running Boards and Splashers

1. Front fender standard, renew one.	
F-4	\$3.00
T-6	3.00
Jr.	4.00
BA, BC	4.00
F and G models	4.25
3. Rear fender standard, renew one.	
All models	3.50
5. Running board, renew one.	
All truck models	2.50
6. Running board and splashers on same side, renew.	
F-4	7.15
T-6	7.15
Jr.	7.15
DA, DC	8.20
F and G	8.20
7. Running board, splashers and front and rear fenders, all on same side, renew.	
F-4	12.00
T-6	12.00
Jr.	12.90
DA, DC	12.90
F and G	12.20
8. Running board bracket, renew one.	
All truck models	1.80
9. Running board covering, renew one side.	

T-6	1.75
Jr.	1.75
DA, DC	1.75

10. Running board binding, renew outer edge only, one side.	
All truck models	1.00
11. Splash pan, front of radiator, install new.	
All truck models	1.80

Frame

10. Renew chassis frame assembly. Covers removal and replacement of body and chassis units, but does not include any repairs to units.	
F-4	\$96.50
T-6	90.00
Jr.	90.00
DA, DC	90.00
FA, FE, FF	101.50
G	101.50
GA, GC	110.50
GD	107.00
11. Replace front cross member.	
All truck models	8.00
12. Replace tubular cross member, front or rear.	
Jr.	4.50
DA, DC	4.50
FA, FE, FF, FC, FD	4.50
GA, GC, GD	4.50
13. Tie-rod at rear of frame, renew.	
F-4	2.75

F.W.D.

Rear Axle

1. Remove and replace rear axle assembly, after it has been re-cluded)	\$1.90
2. Remove, dismantle, inspect, reassemble and reinstall rear axle assembly	3.75
3. Remove rear axle assembly, overhaul and reinstall	7.50
4. Remove and reinstall or renew one axle shaft	.50
5. Remove and reinstall differential carrier assembly, stake body truck	2.25
A. Same operation on dump body truck	2.25
6. Disassemble, inspect, and reassemble differential carrier assembly, after it has been removed from axle	6.75
7. Overhaul differential carrier assembly after it has been removed from the axle	2.25
8. Adjust ring gear and pinion, either axle	1.50
10. Remove and reinstall pinion carrier assembly, bevel gear drive, either axle	1.50
11. Renew axle housing oil retainer, one side	1.70
A. Both sides	3.30
12. Renew wheel bearings, one wheel, full floating type axle	1.50

SERVICE HINTS

From Shop and Factory

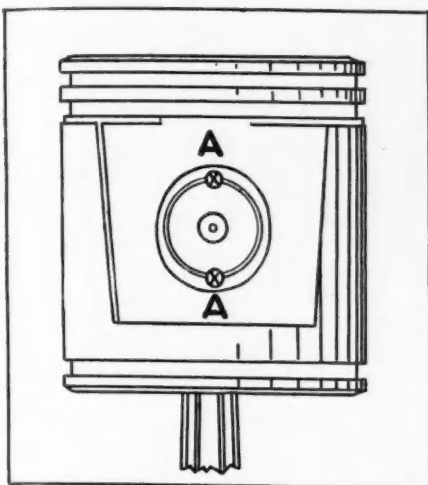


Fig. 1—A relief, .015 to .018, in., must be filed or ground at the piston pin boss when new style piston pin locking is employed

GMT Piston Pin Fit

Pistons pins in Models T-11 and T-19 1929 series engines are now retained by aluminum plugs pressed into ends of pins. The former type pin was locked in piston with a lock screw. These aluminum plugs are punched with a blunt punch forcing a small amount of metal from plugs into chamfer in pin boss.

Pins must be fitted accurately. If pins are too tight, they will set up a



stress in the pistons. If too loose, the pins may oscillate in the piston, wearing away punched material and allowing pin to shift.

To fit pins correctly: Use spiral fluted reamer with pilot and place reamer in vise. Take light cuts, and do not force piston down over reamer; it should go down of its own weight. Reaming should be done with room and part temperature about 70 deg. Fahr.

Piston pin should be wringing fit in piston, that is, one-half to two-thirds through one boss when twisting pin by hand.

Check piston for roundness after connecting rod has been assembled to piston. Limit of out-of-roundness is .0005 in.

After pistons are assembled, use a blunt punch on edge of aluminum end

plugs at two opposite points in order to force a small amount of metal into piston pin boss chamfer. See X, Fig. 1.

New style pins may be used in old style pistons if a relief is filed or ground at pin boss. New type pistons may be used in same engine with old type, providing old type are relieved at piston pin boss and new type pins are used. A gage, Kent-Moore Y-81, is used to determine amount of metal to be removed for relief.

Preheating for Welding

When large cast-iron parts are to be welded, it usually is necessary to preheat them to prevent cracking on cooling. The most practical and economical way of preheating large pieces is the use of a temporary firebrick furnace, according to Linde Air Products Co.

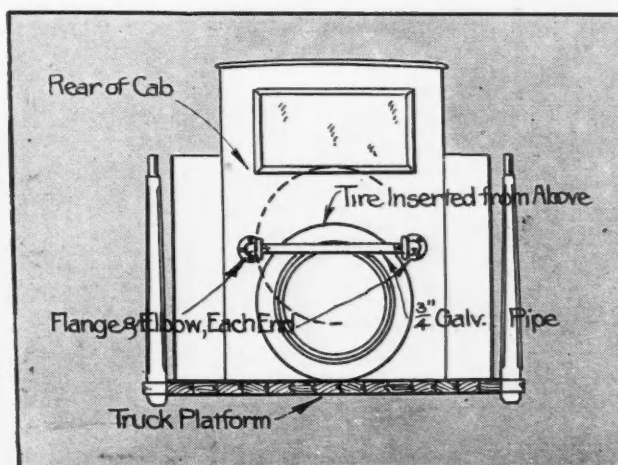
A preheating furnace built of firebrick, with asbestos paper on top, is shown in the accompanying illustration. Spacing of bricks around the base of the furnace assures sufficient draught to raise the part to proper temperature.

Cooling after welding is just as important as heating. The entire part should be covered with fresh charcoal and brought to an even heat. The asbestos paper cover is left in place and the part allowed to cool, and contract, in the dying fire.

Tire Carrier on Cab

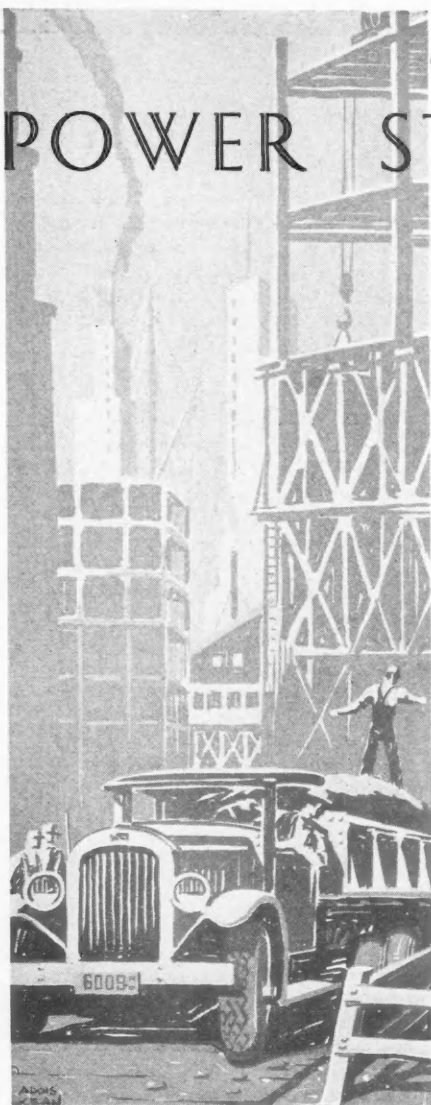
Rear of the cab is the most convenient location for a spare tire on many trucks. A fleet owner made a tire carrier for this position out of galvanized pipe and fittings as shown in the illustration.

A pipe flange screwed to the cab had an elbow screwed into it and pipe extended from an elbow one side to another elbow on the other. Distance between elbows was barely enough to allow the tire to be inserted from the top. The pipe was placed high enough to hold the tire and rim near the top. —Morris A. Hall, White Plains, N. Y.



POWER STEERING ACHIEVED BY BETHLEHEM STEEL

Torque Amplifier Utilizes Engine Power to Reduce Steering Effort



Below—Exploded view showing servo principle of the device. As the steering wheel is moved, an arm extending radially (B) from the shaft (E) carrying the steering wheel moves. Pivoted on this arm is a short bar (C), one end of which is connected with one band at X-X and the other end is connected at Y-Y with the opposite end of the other band. The other ends of the bands are anchored at R-R and S-S to two radial arms extending from shaft (F), which carries the steering worm. One of the two clutches will be engaged by right hand and the other by left hand rotation of the steering wheel. As the radial arm (B) moves the bar (C), the band at X-X is expanded and brought into driving contact with the drum, while the band at Y-Y is drawn away from its drum. With the clutch at the right engaged motion is transmitted to the worm shaft through the band and radial arm (R). During this transmission the other band, of course, is out of engagement. Bar (C) known as the Lashlock insures easy frictional engagement of one band as the other eases out, or vice versa. Besides preventing both bands from frictioning at the same time, it also automatically removes all backlash and compensates for differences in initial length and subsequent wear of the bands. A minimum of clearance is maintained between drums and bands

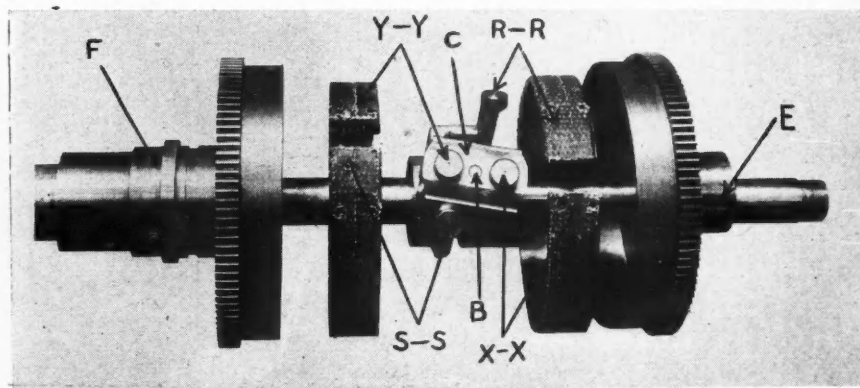
THE Bethlehem steering control, made by the Bethlehem Steel Co., Bethlehem, Pa., is an adaptation of the Bethlehem torque amplifier as originally developed for army ordnance and later applied to industrial uses and the steering of automotive vehicles. The development and research department of the company is prepared to render engineering advice on any contemplated application of the device. The purpose of the device is to step up steering torque, taking its force from the engine of the vehicle. Operation is

in no way different from that of an ordinary vehicle except for the extreme ease of steering. With an amplification of 10 to 1 the car steers with one-tenth of the usual manual effort. It amplifies power, not movement. Amount of movement in the device corresponds exactly with the amount of movement at the wheel and transmission of power ceases with cessation of movement at the wheel.

In parking, turning around in narrow streets, and for other maneuvering where many cuts are required with the vehicle stationary or nearly so, the whole operation can be carried out easily with one hand and without any of the usual strenuous exertion. On rough roads the weight of the hand is sufficient to keep the steering wheel perfectly steady and at high speeds the wheel is unusually stable, conveying a sense of complete security. With the engine dead steering becomes the same as conventional.

The device comprises two small drums driven in opposite directions at slow speed by a universal-jointed shaft driven from the engine. Drive is effected by two gears meshing with the gear teeth on the outer circumference of the drums. Steering is accomplished by engaging either of the two friction-lined expanding clutch bands with their respective drums for right or left steer as the case may be. The principle of operation is explained in the accompanying illustration.

In external appearance the device is a small cylindrical casing on the steering column beneath the floor boards and immediately above the steering gear proper. In four-wheel drive trucks the device, of course, is forward of the dashboard enclosed by the hood in the engine compartment.



WOOD'S NEW HYDRAULIC HOIST IS HAND OPERATED

*Designed to Lift 1½ to 3 Tons in
a 1 to 1½ Yard Steel Dump Body*

THE Wood Hydraulic Hoist & Body Co., Detroit, Mich., has added to its line a hand-operated hydraulic hoist for use on a one-yard steel dump body. The rated lifting capacity of this new unit is 1½ tons with three tons maximum. While the standard capacity of the body is one yard, the front and rear has been built higher than the sides to permit a ¼ x ½ yard increase in capacity by the addition of sideboards.

The entire hoist assembly is carried in a sub-frame as a self-contained unit for ready mounting on any make of chassis. With body attached and in lowered position, it is supported in the front by a raised cross-member of the sub-frame and in the rear by V-shaped brackets, the apex of which is hinged to the sub-frame by means of a round cross-bar. The upper legs of the V-bracket are bolted to the body side rails.

Power is furnished by turning a crank, which is directly attached to an oil pump constructed integral with the base of cylinder. The oil pump is simply constructed, consisting of two gears and one valve. As the gears are rotated by the crankshaft, their close-fitting teeth force the oil under great pressure into the cylinder, moving the piston outward. A ball check valve in the pump automatically prevents the body from lowering unless the operator moves the valve control, which, when released, permits the body to lower by gravity. One-direction movement of the crank is a safety feature, designed

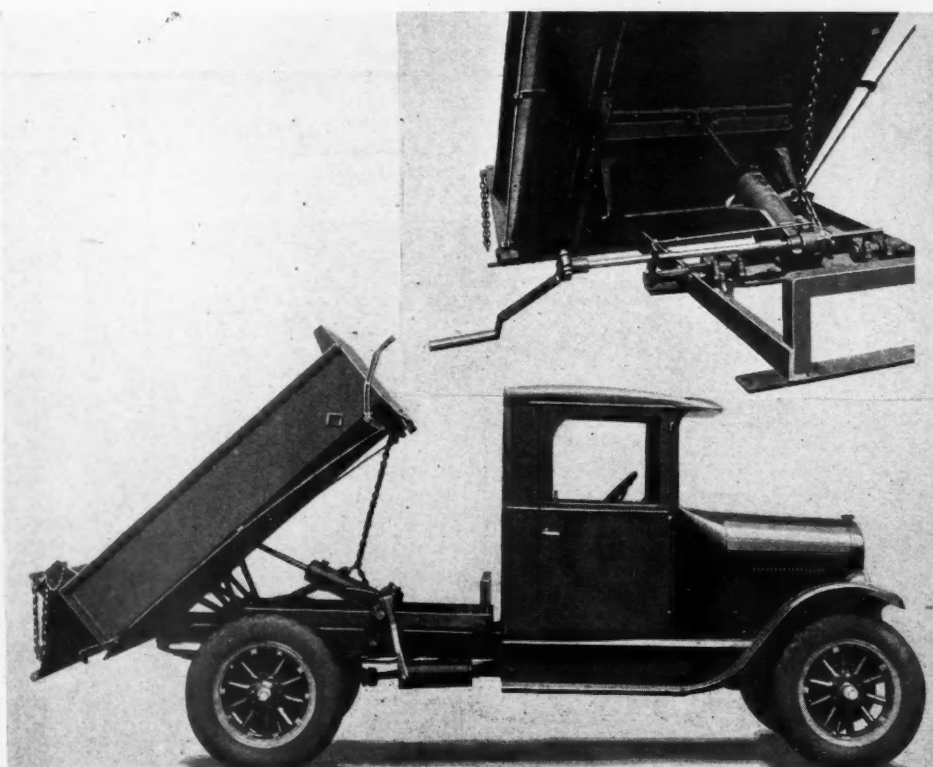
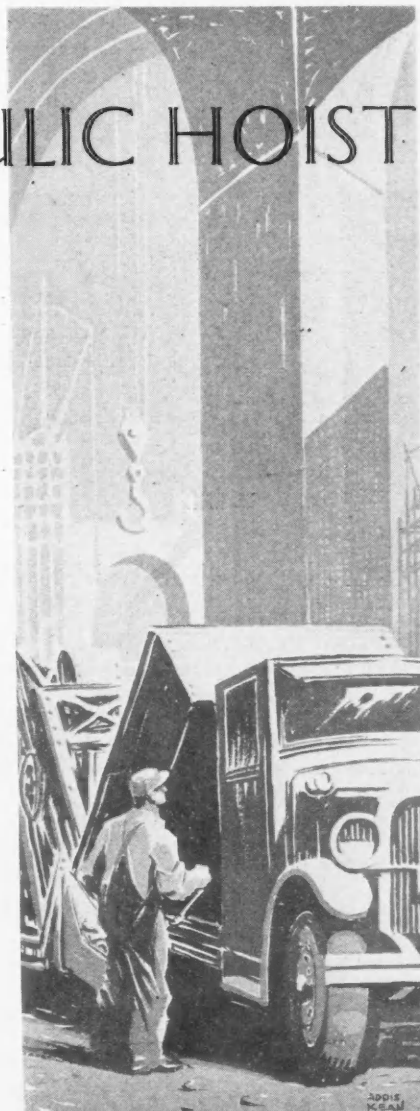
to prevent injury by kicking back when the body is lowering or when the body is partly elevated.

The cylinder, pump and crankshaft is constructed as a single unit, supported on a cross-member which in turn is trunnion-mounted to the side rails of the sub-frame. The upper end of the piston rod is pivot connected to a

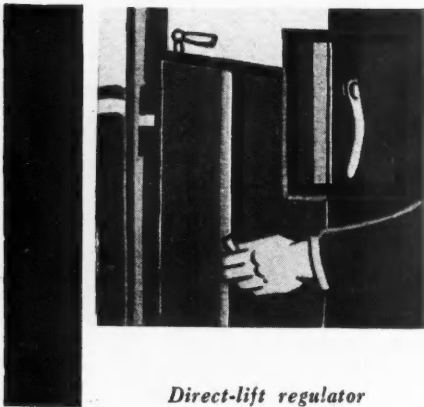
(Turn to page 54, please)

Wood hand-operated hydraulic hoist and steel dump body elevated to discharge position. Note that the body overhangs the hinged bracket, which is attached to the end of the sub-frame

Close-up of lifting mechanism showing trunnion-mounted crossbar, crankshaft mounting, release valve, raised front cross-member and hinge brackets



MARTIN-PARRY HAS



Direct-lift regulator

Stock Bodies for Ford, Chevrolet and Rugby Chassis Designed to Meet Hauling Needs of More Than 50 Business Classifications

THE Martin-Parry Corp., York, Pa., line of stock bodies for light capacity chassis, such as Ford, Chevrolet, Rugby, is designed to meet the transportation requirements of 50 or more business classifications. Among the units offered, which are built to combine appearance with utility, are panel bodies, express, canopy top express, open cab top express, platform, stake, grain, stock rack, etc.

The floors of these bodies are made of long leaf pine, selected because of its resin and turpentine water-resisting content. Joints between floor boards are open to allow for expansion or contraction and are sealed by floor straps. The straps serve to reinforce the base, render the body dust-proof and facilitate handling of loads. To prevent the straps from becoming loose at either end they are held down by bars. Sides are built up of an inside lining of wood in natural finish, a layer of masonite for insulation and heavy gage sheet steel. Rear doors are insulated in like manner. They are built of stamped sheet steel in one-piece and are equip-

ped with nickel plated handles and key lock. Corners are rounded and designed so that the belt runs around them like a ribbon.

Side door panels are one-piece stampings of the sedan type. Special flanged front posts give protection from the weather at the hinge openings. In ad-

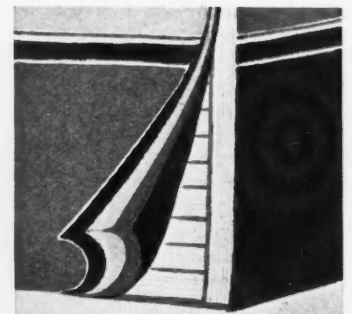
dition to locking handles, both doors are equipped with a patented new type of window lift instead of crank type regulators. It is operated on a direct lift principle and is controlled by a handle, which slides vertically in a grooved rail fixed in the lower section of the door. To raise or lower the

Specifications of Part of the Martin-Parry Line

	Model Car	Length in.	Width in.	Height in.	Panel or Stake Height in.	Net Weight Lb.
FORD DELIVERY						
Panel	500-A	70	44	51	..	800
Canopy Top Express.....	505-A	70	44	51	12½	785
Cab Top Express.....	506-A	70	44	..	12½	740
FORD TRUCK						
Wheelhouse Panel	530-A	108	50	54	..	980
Panel	532-A	108	44	53	..	950
Canopy Top Express.....	535-A	108	44	53	14	900
Open Express	552-A	108	44	..	14	460
High Top Express.....	556-A	108	44	61	14	585
High Top Express.....	558-A	108	44	50	14	580
Wide Express	574-A	96	60	..	18	600
Serial Stake	573-A	93	70	..	30	400
Platform Stake	568-A	104	75	..	42	805
Platform	566-A	106	80	..	..	540
Platform Stock	570-A	103	75	..	60	845
Platform Stake	564-A	92	68	..	30	605
Platform	561-A	96	72	..	..	460
Platform Express	575-A	102	72	..	16	610
Tri-Unit, Farm	565-A	102	72	..	60	815
Ventilating Side Platform.....	579-A	102	72	..	36	745
Ventilating Side Platform.....	577-A	102	72	..	26	665
Platform Stake	582-A	140	75	..	42	1,000



July, 1929



Above: Three-piece side panels.

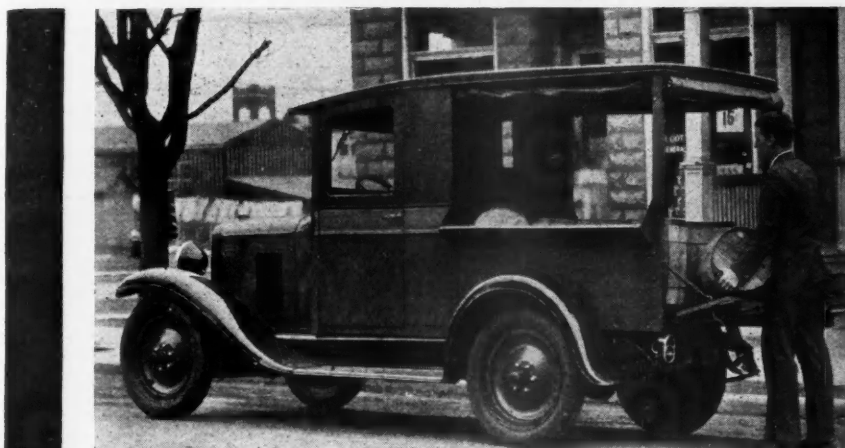
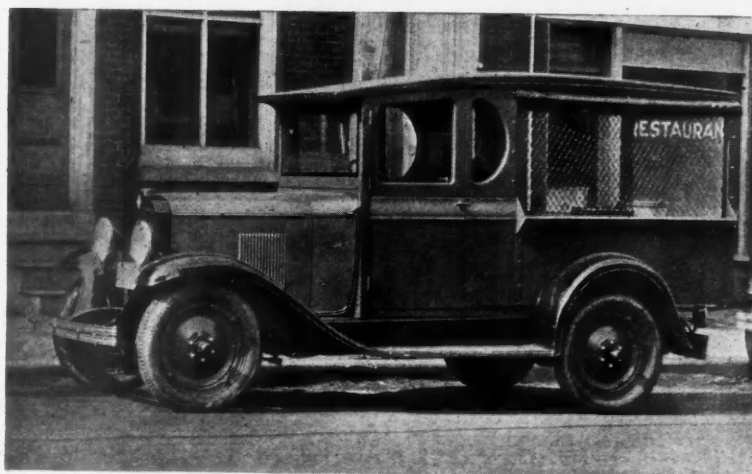
Left: Panel model adapted to the vocational needs of a cleaner and dyer. Note the curved top. The duck covering extends over the sides of the top rail, protecting it and eliminating a source of leakage

VOCATIONAL LINE

window, the vertical handle is turned horizontally. By releasing the handle the window can be held at any position.

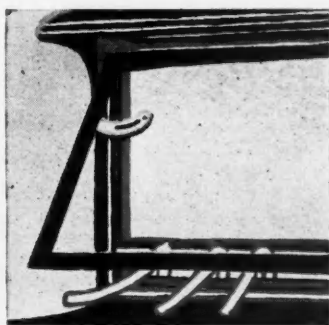
The top is curved with a slight tip of the front and finished in heavyweight duck. This covering comes down over the sides of the top rail, protecting it and eliminating a source of leakage. A heavy rolled steel drip molding is attached on sides and back, while in the front a half oval molding is used to give service and appearance.

Windshields are one-piece and the plate glass fits at the bottom into a rubber section fastened in the cowl. It is equipped with a wiper and is operated by a quadrant which can be opened almost straight. A ventilator is provided at the bottom of the windshield, which forces and circulates air down-



Top: Canopy top express with screen sides mounted on a Chevrolet chassis employed by a plumber. Above: self-locking side window

Above: Canopy top express with curtain sides used for general delivery by a country store. Left: One-piece ventilating windshield



ward around the operator's feet. Windshield posts are of narrow construction reducing blind spots to a minimum.

Another feature of the Imperial cabs is the sliding window at the driver's seat. It slides back and forth in a felt-lined steel channel and can be opened easily from the inside and when closed locks itself. The window provides more ventilation, increases side vision and permits traffic signaling.

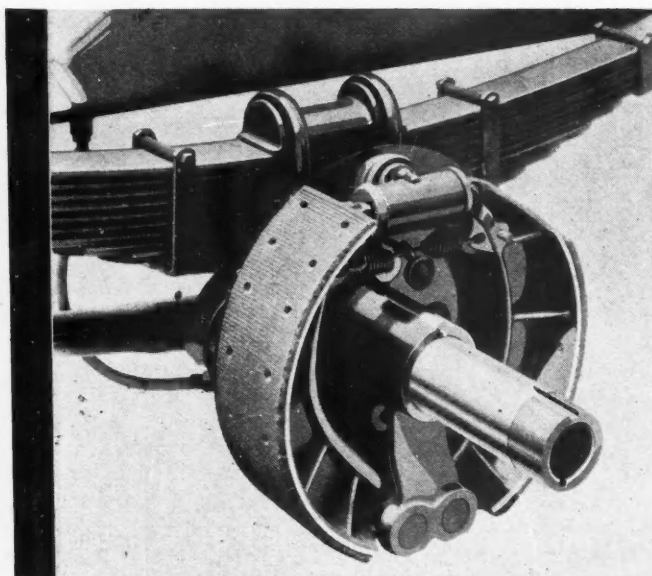
Seat and back cushions are of the overstuffed type. The seat cushions are made with 16 coil springs securely tied. The backs are designed for folding. Upholstery is of moleskin.

In the canopy top panel roll-up curtains at sides and rear and either solid or lazy backs are furnished as standard equipment. Screen sides and double rear doors are supplied at extra cost. The high top express models have steel covered side panels and are also equipped with roll-up curtains, although screen equipment is available at extra cost. Heavy ironing features the wide express model. Stakes sections of Model 573-A are easily removable to facilitate side loading and unloading. Center side sections of the platform stake body are hinged and all stake sections are quickly removable. The floor of this job is ironed with cross skid straps

to facilitate side loading. If desired the platform stock body can be furnished with a drop end gate at extra cost. The farm unit is equipped with a Comstock end gate and top stake racks are removable. Included as standard equipment on the three-panel side ventilating grain body are double break grain and hog end gates in bottom and center panels. The front center sides of the large platform stake, Model 582-A, are hinged. Stakes are removable and the floor has cross skid straps.

Special equipment for the panel bodies include end gate and screen hood with curtains, panel hood and end gate, sliding partition back of driver's seat, full length parcel racks, etc.

FEDERAL ADDS 4-TON SIX

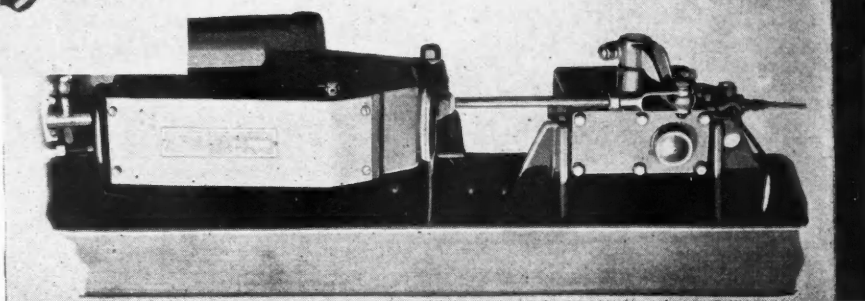


Left—View of the 2-shoe, hydraulically operated service brake on the new 4-ton Federal Model 4C6

Model 4C6 Has 4-Wheel Internal Hydraulic Brakes

booster are standard equipment. Rear wheel brake drums are 18 in. in diameter and 5 in. wide and are fully enclosed. Carburetion is by Zenith and ignition and starting is furnished by the Delco-Remy system. Gemmer cam and lever type steering gear is employed. Large 36 x 8 in. pneumatics

Right—Westinghouse amplifying unit mounted between the service brake pedal and master cylinder



THE newest Federal, a six-cylinder job of 4-ton capacity, is now on the production line. The Federal Big Six, as this model is known, is intended for the great variety of haulage jobs requiring high speed for both local and long distance trips. It is catalogued to the trade by the symbol 4C6.

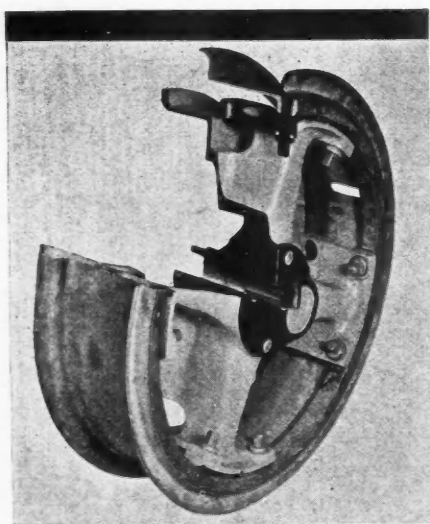
It is powered by a 4½ x 4¾-in. Continental Model 20R six-cylinder engine developing 87½ hp. at 2200 r.p.m. The power line includes a single plate

Brown-Lipe clutch, a Brown-Lipe Model 55 seven-speed transmission mounted amidships and Timken Model 65706 full floating, worm drive rear axle. Four-wheel hydraulic operated brakes of the internal 2-shoe type with vacuum

with dual rears are standard equipment.

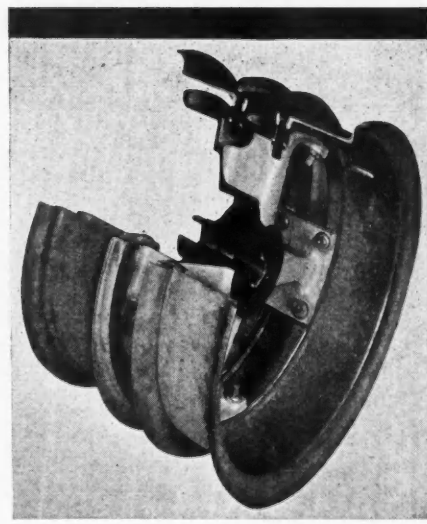
A Federal Comfort cab is available as well as a new design known as the Sleeper Cab. The latter is designed to afford ample space for a berth, without taking up much pay-load space.

CONVERTIBLE TRUCK WHEEL



Separate Mounting of Rims Adapts Wheel for Single or Dual Tires

Cutaway views of the Michigan Steel Casting wheel, showing mounting and location of rims for single or dual tire purpose. Note air space outside of brake drum



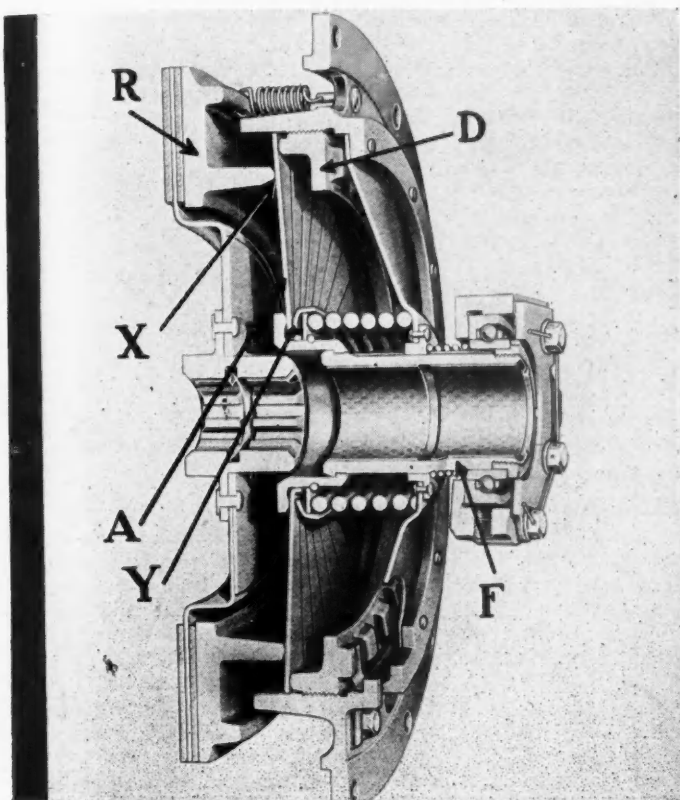
A CAST steel dual wheel for bus and truck use, introduced by the Michigan Steel Castings Co. of Detroit, provides a separate and independent holding of each rim, fixed spacing between the rims, reversible rims,

(enabling use of wheel as single-tire type) and good ventilation and cooling for brake drums. The wheel consists of four steel spokes and a pilot flange for the drum. At the outer end of the spokes are drilled flanges for mounting either single or dual rims. The latter are located by pins projecting outward from these flanges and are secured on by radial bolts, two to each spoke per rim. The locking rim ring is located by a boss on the hot-rolled section of the rim proper. Since the rims overhang the wheel, rim retaining bolts

and tire valves are easily accessible.

By removing the outer rim and moving the inner rim to the position of the former with the locking rim on the outside, the wheel may be quickly converted into a single-wheel type.

BROWN-LIPE BUILDS SINGLE PLATE TRUCK CLUTCH



Spring Pressure Applied by Circle of Steel Segments Gives Powerful Leverage and Easy Engagement

Left—Brown-Lipe single plate clutch. Lever action of the segments A provides strong pressure on the pressure ring R. The fulcrum for each segment is the adjusting ring D and pressure is applied at X. The segments are cupped at the inner ends and receive thrust of the single clutch spring at Y. The sleeve F incorporates an oilless type bushing

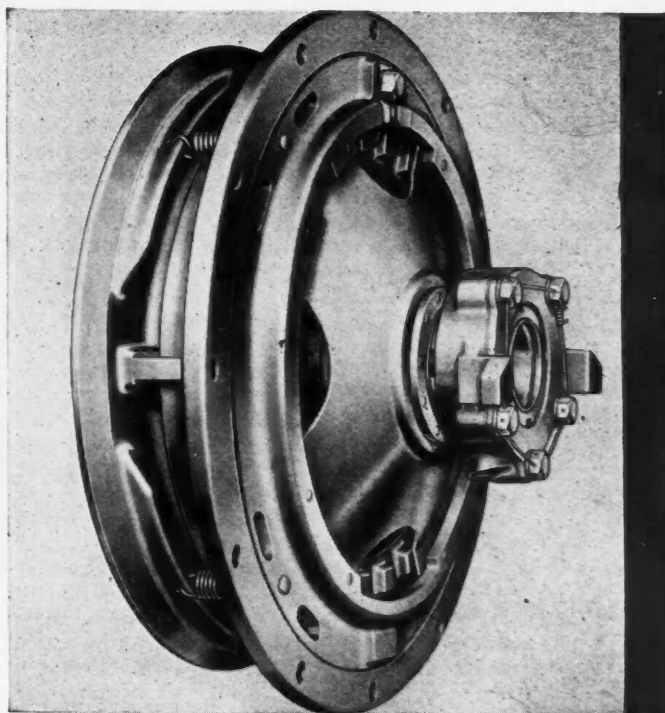
BROWN-LIPE GEAR CO., Syracuse, N. Y., is making a single plate clutch in addition to its line of multiple disk clutches. Three sizes, 10, 12 and 14 in., are available now and a 16 in. size will be added later.

A feature of the plate clutch is the manner of applying spring pressure to the driving ring by means of a large number of steel segments, making up a circle, like a pie cut into small pieces. These segments provide smooth and positive engagement. The action is explained in the captions, accompanying the illustrations.

The plate, of dished section, with riveted facings, is riveted to a splined hub mounted on the end of the clutch shaft. It is reinforced at the center by a circular disk fastened by the same rivets which hold it to the disk. The release bearing is of the ball type and is fully enclosed. A single non-adjustable pressure spring is employed and four release springs fully disengage the pressure ring when the clutch is released.

Adjustment is accomplished by a large threaded ring with notches on the outside edge which is retained in position by a lock engaging with a space between notches.

Below—Clutch is adjusted for wear, not spring pressure, by moving the notched adjusting ring clockwise. The ring is retained in position by a lock finger which is bolted in place



NEW PRODUCTS FOR THE TRUCK MARKET

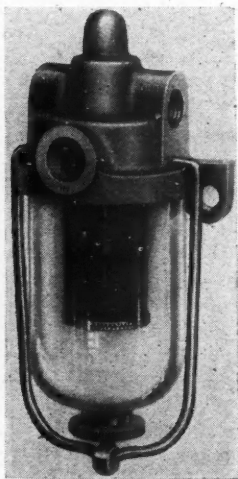


Hydraulic Jack

The Standard Super-Power jack made by the National-Standard Co., Niles, Mich. and designated as No. 69 is hydraulically operated and will accommodate trucks up to 15,000 lb. It is balanced for easy spotting with wide spaced castor wheels in front to prevent tipping. Long or short strokes lift the load and engagement of release lever lowers load. With handle locked the jack may be pivoted on front wheels for placement. Specifications: Wheelbase, 31 in.; width, 16 in.; lowered height, 5½ in.; raised height, 15¾ in.; weight, 282 lb.; capacity, 15,000 lb. No. 68, the Standard Giant, is designed for overhanging buses. Specifications: Wheelbase, 44 in.; width, 22 in.; height, lower and raised 6 and 17 in.; weight, 345 lb.

Fuel Filter

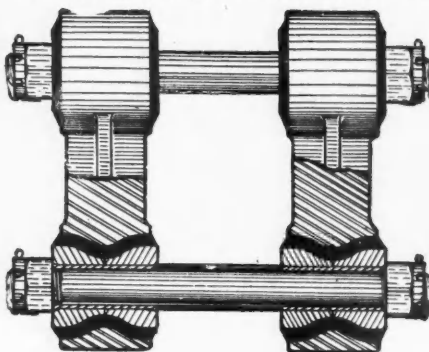
The heavy-duty fuel filter designed for truck use by the Zenith-Detroit Corp. delivers 25 gal. per hour under 1 lb. pressure and 78 gal. under 2 lb. The filtering element consists of thin brass washers and spacers alternately stacked on a stem and clamped tightly. Cracks of 3½ thousandths of an inch are formed by the spacers. The out-



side surface is smooth and is kept clean by the swirling of the fuel in the bowl. Fuel enters at the top, passes into the bowl, through the filter and out at the other side of the top. Dirt settles to the bottom of the bowl. List price is \$5 or \$5.75 with glass or brass bowl respectively.

Rubber Shackle

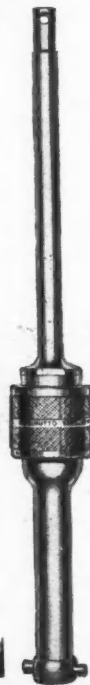
A replacement shackle made of rubber is being made by the Powell Muffler Co., Utica, N. Y. Rubber bushings, steel sleeves and metal cones are forced



into the shackle sockets under pressure, forming an integral unit. Around the center of the spring bolt, which is fitted with castellated nuts and cotter keys, is a thin closely wound bushing shim, which can be pared down to facilitate fitting at this point. All oscillating action is taken by the rubber.

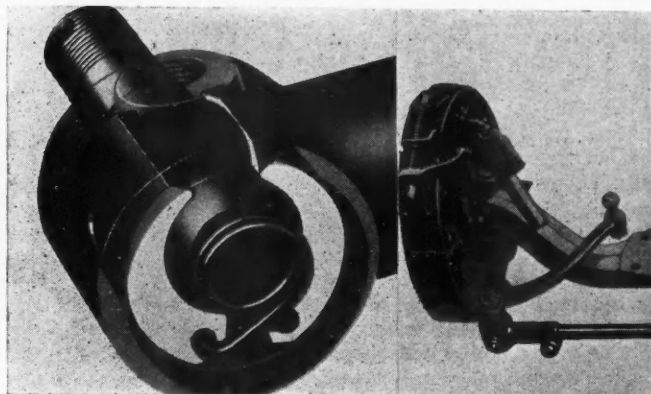
Adjustable Spindle

The Hutto Sleeve adjustment driving spindle, made by the Hutto Engineering Co., Inc., Detroit, for use with Hutto grinding equipment, makes it unnecessary to disengage universal in order to expand stones. It makes adjustment possible without tools and even when the grinder is at bottom of block. Adjustments can be made up to .0015 in. Price, \$23.



Inner Ring

The American Hammered Piston Ring Co., Baltimore, Md., is offering ventilated inner rings for installation behind vented oil and compression rings. Listing at 20 cents each they are available in sizes ranging from 2½ to 5½ in.



Sectional Radiator

A radiator containing seven sectional cores is announced by United Auto Radiator Service, 1697 Jerome Ave., N. Y. Each section is separate and independent and is attached to upper and lower tanks by single bolts. Leaking sections can be easily and quickly removed and replaced by another section, without disturbing the rest of the core. If no spares are available at the moment, the radiator can be used minus one or two sections.

Replacement Tie Rod

Eccentric bearings are used in a tie rod introduced to the replacement trade by Thompson Products, Inc., Cleveland. Two bearings in each socket are wedge-shaped and a torsion spring applied to their thicker edges closes the bearings around the ball as wear occurs, which prevents looseness and rattle. The vertical sockets provide greater clearance when used on axles equipped with front wheel brakes and balloon tires. Ball stud and bearings are inserted in the socket from the bottom after which the socket is sealed by a metal plug forming a reservoir for the lubricant.

QUICK SERVICE

(Continued from page 23)

many external signs, such as the mushroom growth of numerous independent agencies springing up everywhere specializing on various quick, necessary jobs, are mustering their forces and will shortly follow suit. Manifestly, quick service represents a lucrative field of business endeavor and if independent agencies are capitalizing the trend why shouldn't the existing service stations?

An interesting example of what quick service means to a service station is the accomplishment of a successful Philadelphia truck branch service station. The service manager of the shop, finding that his service sales were falling off, decided to study the situation. He discovered that a considerable portion of his losses were in jobs of the quick-service classification, such as relining brakes, adjusting clutch and clutch brakes, changing magnetos, engine tune-ups, etc. He set about recovering some of this business. Quick service was established. An increase of 60 sales per month averaging \$8 each for labor was the result. This meant about \$6,000 more a year for labor only and not to mention increased parts sales.

Whether the service station is large or small, in the city or country, the plan of operation in its broader aspects is very similar. The fact that service stations will differ as to what jobs should be included in the quick-service classification also will not affect the general plan of operation.

Shops offering their patrons quick service incorporate the following:

1. Trained quick-service men.
2. Ample ground floor space and easy access to street.
3. Quick paper work.
4. Special shop equipment for fast work.
5. Reasonable flat rates.
6. Merchandising.

Expert inspectors or service salesmen are the keystone of the whole plan and upon them the success of the enterprise rests. Not only must they be versed in trouble-shooting but be expert in the remedy, and if they contact the customer they must be pleasant and courteous as well.

Space set aside for quick service should not only be ample, but on the ground floor, close to the entrance, easily accessible and, if possible, separated from ordinary service jobs. In combination shops, they should be apart from the passenger-car section. The reason for doing this is obvious: speed. Moreover, ordinary truck service and passenger-car service should not be permitted to interfere or clash with quick service. Separation prevents this. The importance of accessibility is illustrated by recent changes

made in the servicing facilities of two dealer service organizations. One concern changed its service headquarters from an expensive down-town location, where its shop was on the second floor, to an up-town location primarily to provide better servicing facilities. The shop is now on the ground floor, it is ample in size and easily accessible. The other concern, experiencing considerable difficulty from blockades in its passageways, which hampered quick service, eliminated the trouble by changing its entrance and exit doors.

Paper-work not adapted to quick service will defeat the end in view. Writing out orders, making out bills and handling money take time and nothing tests a man's patience more than to be compelled to wait, after a 10 or 15-minute repair or adjustment is finished. Besides, application of the regular system to small quick service jobs will boost the department's overhead.

Equipment adapted to quick service jobs makes fast work possible. Benches should be conveniently located, proper lighting provided, small parts easily accessible and proper tools handy.

The desirability of charging quick jobs on a flat rate basis is self-evident. Small jobs taking 15 min. if charged on an hourly basis probably would not pay the shop because of the loss of time between jobs. As a matter of fact there is no reason why small jobs should not provide a worth-while margin of profit. The charge may be reasonable and still bring a higher return than is possible on an hourly basis. The owner is satisfied because he benefits by the quickness of the job.

Quick service should be merchandised in order to attract more business and sell more owners on the value of preventive maintenance. One successful truck dealer makes excellent use of posters, hanging them on the walls in the quick-service department. These posters carry reminders and suggestions such as the following: "Have your battery and generator taken care of now. It will keep your upkeep down. No charge for inspection"; "To get service from your engine have oil filter cartridge changed after every 10,000 miles"; "Ten greasings \$8—A 20 per cent saving to you"; "Have your truck inspected every 500 miles. Know your truck's condition"; "Our service policy is your protection. We are never too busy to serve," etc. Many establishments maintain a card index system by means of which they keep posted as to the service record of all owners. When an owner fails to appear he is communicated with to let him know that the dealer or branch is interested in the welfare of his truck and that quick-service facilities are provided.

The plan of quick service employed

by a successful combination passenger car and truck service station in one of the eastern cities is particularly interesting from the standpoint of meeting the requirements set down hereinbefore and is worthy of resumé. Whether truck or passenger car, all arrivals enter through the same door, but the trucks pass straight through the first department, which is for passenger cars, to the commercial vehicle department just beyond. The driver is received and directed by a courtesy man. After parking his truck on either side of the central aisle and between diagonal white guide lines, the driver immediately reports his truck in at the Register Desk, no matter what the purpose of his visit may be. The man in charge at this desk promptly records the owner's name, truck license number and time of arrival on his working schedule, and immediately assigns a service man to the truck to render a report. The service man quickly diagnoses the trouble and reports back to the Register Desk. If the job will take more than 30 min. the truck goes through regular routine and is dispatched to the shop. But if in the opinion of the registrar the job is quick service, he either reassigns the original inspector if he isn't busy, or requisitions a man from the shop. The driver is notified when he may expect the truck and is invited to the waiting room. Time of the promised release is posted on the working schedule and in this way the registrar keeps in touch with all operations. Instead of writing out an order for each quick service job, the registrar keeps a personal record of them and after an accumulation of eight or ten, he writes out one order for the entire batch.

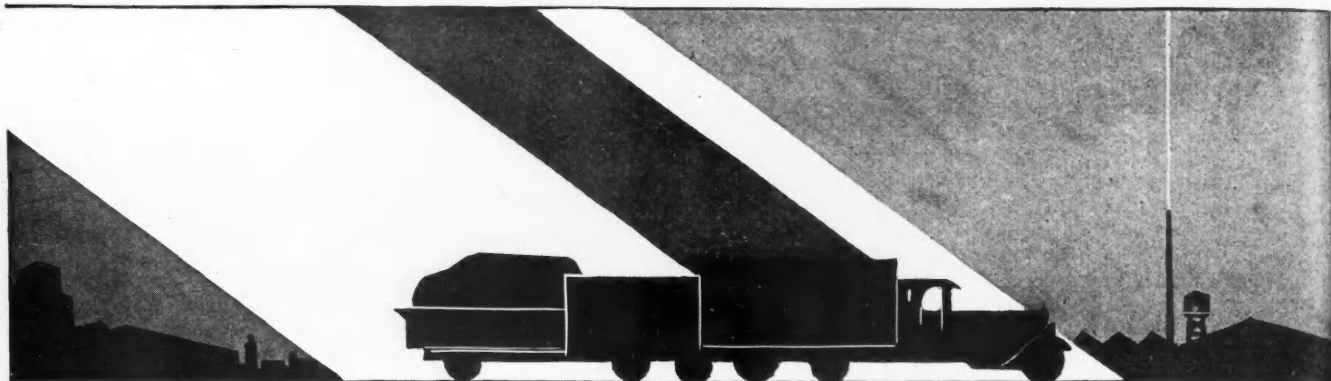
This plan simplifies matters when the job is complete; the driver merely pays the registrar or, in case of a standing account, signs for the job. No time is lost. The shop by batching several jobs on one order also cuts paper-work overhead.

A reputation for handling service work efficiently and with dispatch is a valuable asset for any shop and particularly for branches and dealers. Service managers capably handling the problem of quick repairs not only increase the profits of their department but ease the way for future sales by acquiring a name for good service and performance for their trucks.

Farm Trucking Systems

Truck transportation of fruits and vegetables has become so large a factor in the distribution of the nation's food supply that the U. S. Bureau of Agricultural Economics has started reporting truck receipts at seven of the largest markets. Specialists of the bureau predicted that there will be developed organized trucking systems for the transportation of perishable vegetables from producing areas to marketing centers throughout the country.

TRUCK INDUSTRY



N = E = W = S

Stewart Announces Two New Trucks

Stewart Motor Corp. announces two new sixes of 1½ and 2-ton capacity, equipped with four-wheel Bendix mechanical brakes, radius rods and helper springs. The light model is offered in 136, 145, 160 and 176-in. wheelbase lengths and is priced at \$1,495, while the 2-ton model listed at \$1,695 is offered in 145, 160 and 176-in. wheelbases. Both models have 4-speed transmissions, electric lights, starter, gasoline cleaner and air cleaners. Complete details will be given in the next issue.

Heil Advances Petrie

A. J. Petrie has been appointed assistant branch manager of the Heil Chicago branch. Mr. Petrie was formerly service manager and is well known to the trade in the Chicago district.

Hudson Appoints Irvine

E. J. Irvine has been appointed manager of the fleet sales department of the Hudson Motor Car Co. The last seven years of Mr. Irvine's connection with the Hudson Company has been devoted to fleet sales.

Kline Joins Grace & Holiday

Harry D. Kline has been appointed assistant to the president of Grace & Holiday, advertising counsel of Detroit and New York, according to Edward R. Grace, president. Mr. Kline for the past five years has been advertising manager of the Continental Motors Corp. He will continue to direct the public

relations division of Continental and serve as a personal representative of R. W. Judson, president, and W. R. Angell, vice-president of Continental.

Gramm Forms Sales Unit

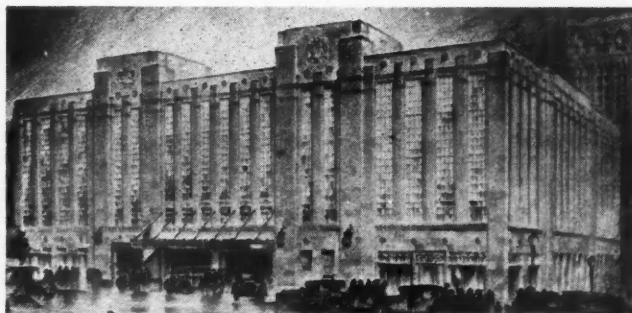
The Gramm Motor Truck Sales Corp., capitalized at \$100,000, was recently incorporated at Toledo, Ohio, to take over almost the entire output of Gramm Motors, Inc., B. A. Gramm is president of the new company.

Evers Succeeds Engels

Chas. H. Wondries, of the Commercial Car Department of the Studebaker Corp. of America, has announced the appointment of A. W. Evers as sales promotion manager for the commercial car division. Mr. Evers succeeds J. L. Engels who has become commercial car representative on the west coast.

Gartley Heads Whippet Sales

P. C. Gartley has been appointed general sales manager of the Whippet division of the Willys-Overland Co., with headquarters at the main office in Toledo.



Sales and service headquarters of Indiana trucks in Richmond, Va. The building affords 23,000 sq. ft. of floor space. Ray B. Roberts is vice-president.

Atterbury Building New Series of Sixes

The Atterbury Motor Car Co. has announced a new series of trucks of 2½, 3 and 4-ton capacities, known as the Marathon Sixes. Streamlining and lowness are effected by front end design and low frame. Engines are of the overhead valve type, developing 70, 80 and 90 hp., in the three models respectively. The two lighter models are equipped with Lockheed four-wheel hydraulic brakes, while the four-ton model is furnished with mechanical rear-wheel brakes. All are energized by vacuum boosters. Heavy duty pneumatic tires are standard equipment with dual rear wheels.

Merrick Heads Westinghouse

F. A. Merrick was elected president of the Westinghouse Electric and Manufacturing Co. at the meeting of the directorate, June 26. The board also announced that while it accepted the resignation of E. M. Herr, president since 1911, it elected him vice-chairman of the board. Mr. Merrick advances into his new position from the post of vice-president and general manager.

More Brockway Directors

At the annual meeting of the Brockway Motor Truck Corp. it was voted that the directorate be increased to ten members. The following were elected: J. Mitchell Hoyt, C. K. Woodbridge, C. M. Finney, Ernest Stauffen, Jr., and P. J. Ebbott. A. J. Buck and W. N. Brockway retired from the board.

Because It Gives Easier, Safer Steering

30
MANUFACTURERS
OF
Buses
USE ROSS

76
MANUFACTURERS
OF
Trucks
USE ROSS

OVER ALL ROADS and at all speeds, on the highways and in crowded city traffic, Ross Cam and Lever Steering gives easier, safer handling. It reduces the hazards of truck and bus operation, speeds up schedules and minimizes maintenance expense. Most manufacturers of trucks and buses have adopted Ross as standard equipment. For trucks and buses not originally Ross-equipped we supply Ross Replacement Units. These replacement gears give exactly the same results as standard equipment jobs—ending jiggle and jerk in the steering wheel, providing easier wheel-turn and vastly greater steadiness and security. Write for complete information.

ROSS GEAR AND TOOL COMPANY
LAFAYETTE, INDIANA

ROSS
**Cam & Lever*
STEERING

** Exclusive with ROSS*

Autocar Directors to Study Merger

R. P. Page, Jr., president of the Autocar Co., Ardmore, Pa., issued a statement that a committee of directors of the company had been appointed to study the advisability of a merger with interest representing the Brockway Motor Truck Co. It was also stated on authority that a condition of the possible merger would be retention of the Autocar name and corporate identity, and that no merger would be considered under any other conditions. Beyond the appointment of the committee no overtures toward merger have originated with the Autocar Co. Rumors that Brockway affiliations have acquired large blocks of stock from Autocar holders were stated to be partly true in that a few options have been issued for the sale of stock in the Autocar Co.

Judgment of Forfeiture

Information merely charging that illegal beverages were loaded on a truck at night is inadequate to support a judgment of forfeiture of the vehicle under the smuggling laws, according to a case recently reported by the Circuit Court of Appeals for the First Circuit. The court ruled that there must be definite information of smuggling. The case was appealed to the Circuit Court by Pierce-Arrow Sales Corp., which had sold the truck involved on a conditional sales contract and intervened in the initial proceedings.

Pierce-Arrow Approves Deal

The Pierce-Arrow Motor Car Co. at a meeting of the board unanimously approved the offering of the Studebaker Corp. to exchange stock on the basis of 2½ shares of Pierce-Arrow Class A for one share of Studebaker common. Deposits of Pierce-Arrow stock are to be made on or before Sept. 12.

Krohn at Buchanan

W. G. Farnsworth, president, Krohn Differential Corp., announces that enlarged facilities have been procured for the production of Krohn Compensating Differentials at Buchanan, Mich. The plant obtained is that of the Campbell Transmission Company. The former company will also continue the manufacture of Campbell transmissions.

N.S.P.A. "Shop Profits"

More than 2500 N.S.P.A. wholesalers and owners and employees of automotive shops attended a merchandising meeting recently in Philadelphia and heard Tom Duggan, merchandising service director of the organization, talk on "Shop Profits." W. E. McIlroy, president, and E. P. Chalfant, executive vice-president, spoke.

Sterling Earnings Increase

Net profits of the Sterling Motor Truck Co. for the first six months of the fiscal year show an amount equal

to that of the entire year of 1928, according to an official announcement. The company also reports that the deliveries of trucks during March and April successively set new monthly records.

Hudson Names Austin

P. L. Austin has been appointed manager of the Commercial Car Division, export department, of the Hudson Motor Car Co. Mr. Austin, who will promote sales of Hudson's new light delivery vehicle, the Dover, has been an automobile dealer and distributor.

Kreamer Named Branch Manager

N. W. Kreamer has been appointed branch manager of the Federal Motor Truck Co., for the New York metropolitan area. Mr. Kreamer was formerly with the American-LaFrance and Foamite Corp. He started in the automotive industry with the Sterling Truck Co. fourteen years ago.

Weatherproof Buys Plant

Weatherproof Body Corp. recently purchased the plant formerly used by the Field Body Corp., Owosso, Mich. The new plant will be operated as a second unit of the Corunna factory. The company makes truck cabs and bodies.

Fordyce B. Caswell

Fordyce B. Caswell, vice-president and director of sales of the Champion Spark Plug Co. since 1912, died in June from a heart attack following a minor operation. He was 61 years of age.

Lycoming Sets Record

The Lycoming Manufacturing Co., Williamsport, Pa., subsidiary of Auburn, has broken all records for production both for May and for the first five months of 1929. Gross sales for May amounted to approximately a million and a half dollars, with a total production of 7519 engines.

Perfex Promotes Tambert

John W. Tambert, who for five years has been manager of the cost and manufacturing departments of the Perfex Corp., has been advanced to the post of secretary and treasurer, succeeding C. G. Phelbs, resigned.

Coming Events

SHOWS

Atlantic City—American Bottlers of Carbonated Beverages.....Nov. 11-15
Chicago—Motor & Equipment Assn. Nov. 4-9
Detroit—National Standard Parts Assn.Nov. 11-16
Chicago—National Automobile Show, Jan. 25-Feb. 1
New York—National Automobile Show, Jan. 4-11

CONVENTIONS

Atlantic City—American Electric Railway Association.....Sept. 28-Oct. 4
Chicago—National Automobile Dealers Assn.Jan. 27-28
Chicago—National Safety Congress, Sept. 30-Oct. 4
Detroit—National Standard Parts Assn.Nov. 11-16

N.A.D.A. Advocates "Closed Territory"

An official resolution urging all manufacturers to return to the principle of "closed territory" in dealer contracts was adopted by the directors of the National Automobile Dealers Association at the mid-year meeting. The action was taken following the announcement of the National Automobile Chamber of Commerce that it had no authority to consider the request made by the N.A.D.A. at the January convention for a conference committee meeting between the two organizations to discuss factory-dealer relations. Another resolution urged manufacturers to abandon the present practice as it relates to discounts on fleet buyers' purchases. The board recommends that instead of the present 10 per cent discount on list offered to fleet buyers, the discount be applied on the difference between list price and the trade-in value of the used vehicle.

Reo Keeps Pace

C. E. Eldridge, general sales manager Reo Motor Car Co., reports that production for the first five months of 1929 totaled 20,121 units compared with 19,632 in the corresponding period last year.

Highway Promotes Jahn

The Highway Trailer Co., Edgerton, Wis., has announced the appointment of Chas. R. Jahn, as sales manager of its commercial sales division. Mr. Jahn has been in the automotive field for 26 years and was recently manager of the Minneapolis branch of the company.

Baker With Autocar

Wm. E. Baker, formerly with International Harvester Co., has been appointed manager of the Providence factory branch of the Autocar Co. He succeeds J. E. Higgins.

Four White Promotions

Jay Rathbun, vice-president of the Eastern Division of the White Co., announced the following promotions: George Milton Wilkins, district manager at Albany, N. Y.; Stewart B. Smith, branch manager at Syracuse, N. Y.; J. R. Holliday, manager of the Reading, Pa., branch, and A. T. Coldey, district manager at Buffalo.

Zummach Leaves Husky

J. G. Zummach, vice-president and general manager of the Husky Corp., has sold his holdings and resigned his position. Mr. Zummach organized the Husky Wrench Co. of Milwaukee in 1924. His plans for the future are not known.

Acquires Distributorship

Standard Spring Service, Inc., Newark, N. J., has acquired the eastern distribution of California Steel Wheels for change-overs from solid to pneumatic tires. This company maintains its warehouse and salesrooms at 240-242 Central Ave.

TWO NEW STEWART TRUCKS

New 1½ Ton

\$1495 Chassis

6 Cylinder

4 Wheel Brakes



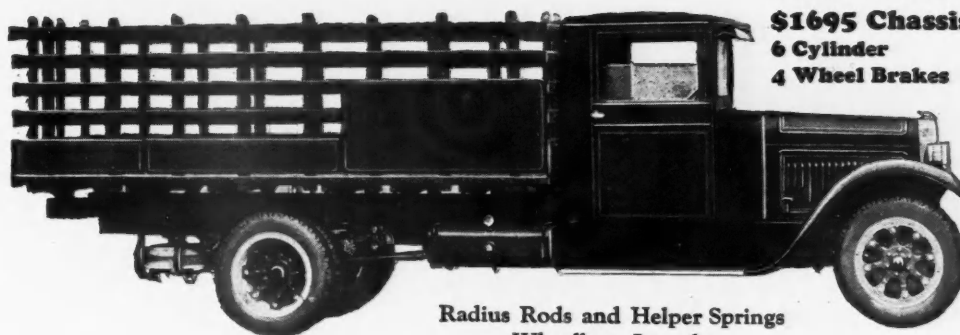
Radius Rods and Helper Springs
Wheelbase Lengths
136, 145, 160, 176 inches

New 2 Ton

\$1695 Chassis

6 Cylinder

4 Wheel Brakes



Radius Rods and Helper Springs
Wheelbase Lengths
145, 160, 176 inches

"Honest Trucks—Honestly Rated"

Sensationally Priced

TWO new honestly rated trucks offering unequaled value at prices nothing short of sensational. Stewarts are not inflated capacity trucks ... from radiator to tail light they are "real" trucks designed and built by an exclusive truck maker.

These Stewarts are equipped with radius rods, auxiliary helper springs, 6 cylinder "truck" motor, 4 speed transmission, electric lights and starter, gas filter and air cleaner. Beyond question they offer the greatest dollar value in truckdom.

Stewarts are built to give 5 to 10 years of constant service. A side by side comparison will prove conclusively that Stewarts are "The World's Greatest Truck Value" ... unequaled at their price.

Stewart Sales are increasing

Stewart sales in 1926 were 41% greater than in 1925; in 1927 45.7% over 1926; in 1928, 53% ahead of 1927. To date, 1929 sales are far exceeding those of 1928. Learn why. Correspondence with distributors and dealers invited.

STEWART MOTOR CORPORATION

BUFFALO, N. Y.

Export Branch: 1 BROADWAY (Dept. 3) NEW YORK CITY, U. S. A.

Cables: Stewartruk New York. Codes (Acme, Bentley, ABC 5th Improved 5 & 10 Letter Universal Trade Code)

Models

¾ Ton
6 Cylinder, \$895 Chassis
1 Ton
6 Cylinder, \$995 Chassis
1¼ Ton
6 Cylinder \$1295 Chassis
1½ Ton
6 Cylinder, \$1495 Chassis
2 Ton
6 Cylinder, \$1695 Chassis

Stewart
MOTOR TRUCKS

Models

2 Ton Special
6 Cylinder, \$7200 Chassis
2½ Ton
6 Cylinder, \$2690 Chassis
3½ Ton
6 Cylinder, \$3690 Chassis
4 Ton
6 Cylinder, \$4200 Chassis
5 to 7 Ton Model
Coming
All prices f. o. b. Buffalo

Stewart Trucks Have Won By Costing Less to Run

RATE STRUCTURE

(Continued from page 27)

1. Explosives.
2. Acids in carboys, unless the carboys are completely boxed or boxed with the necks projecting, but protected.
3. Aeroplanes, flying boats or other aircraft.
4. Billiard or pool tables, set-up.
5. Corpse.
6. Fire-fighting machinery.
7. Fur goods, including fur robes or rugs.
8. Household goods, not boxed or crated, exceeding 250 cu. ft.
9. Livestock.
10. Machinery or other articles weighing in excess of 10,000 lb. per piece or unit, unless accepted subject to delay for special equipment.
11. Silks or silk goods.
12. Horse-drawn or self-propelling vehicles, including automobiles, automobile trailers, trucks, wagons and freight sleds.

The motor carriers, it should be noted, restrict the acceptance of freight exceeding 10,000 lb. per piece in weight, or exceeding 15 ft. in length, 6 ft. in width, or 6 ft. in height, to qualified acceptance subject to delay for suitable equipment or refuse to accept such freight at all if suitable equipment is not available.

Because of differences in the conditions surrounding motor freight and railroad transportation, the motor freight carriers using the Central Union Truck terminal provide special ratings upon many articles which are accepted

for transportation by both rail and motor carriers.

The selected articles and ratings listed in the lower left corner may be regarded as typical.

Special Packing Regulations

Certain articles which are handled by the railroads in bulk or in certain types of containers which are not adapted for transportation by motor trucks are accepted by motor carriers subject to special packing restrictions. Among articles of this class, the following arrangement may be considered typical:

1. Coal is accepted only in barrels or boxes.
2. Cigars or cigarettes are accepted only when packed in wooden boxes which are nailed or screwed at all edges and reinforced at or near the ends of the boards by continuous wire strips.
3. Pitch or tar is accepted only when packed in tight barrels.
4. Charcoal is only accepted in double paper sacks or in barrels.

Class Rates

Class rates are established by the motor carriers operating through the Central Union Truck Terminal of Indianapolis, through the Truck Terminal Association of Indiana. These rates are made upon the basis of distance, the rates grading upward upon five-mile distance blocks up to 100 miles, and upon ten-mile blocks between 100 and 200 miles. Rates are not provided for dis-

tances exceeding 200 miles. Three classes are provided for application upon freight rated first class or lower. Freight rated lower than third-class is given third-class rates. Multiples, and multiples and fractions of first-class rates are determined by simple calculation.

Rates between any city or town served by the motor freight carriers of this association are determined by locating the points and determining the base mileage distances and by applying the scale of rates shown in the accompanying table. Thus, a shipment of one hundred pounds of cotton felt in a compressed bale, moving between Indianapolis and Smithville, a point 114 miles distant, is rated at the first-class rate for distances between 110 and 120 miles, which is shown in the accompanying table to be 58½ cents per 100 lb.

The table on page 27 shows rates for distances up to and including 200 miles, upon first, second and third-class freight, rated at 3 times, 2 times and 1½ times first class.

Wood Hydraulic Hoist

(Continued from page 43)

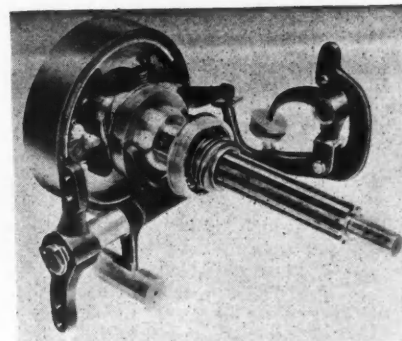
body cross-bar located about midway between front and rear. A heavy chain, held by a heavy coiled spring to take up slack, prevents raising beyond a certain height. One end of the chain is attached to the forward end of the body and the lower end to the piston-carrying cross-member.

The fixed hinged point at the rear provides high ground clearance at tail-gate when dumping, and the overall height of the body in normal position is sufficiently low to permit easy hand-loading.

Stewart-Warner Brake

(Continued from page 39)

a stabilizer is provided. Furthermore, the entire system is controlled by traction at the rear wheels. When the rear wheels are stopped, no further traction is available for applying additional force. Because of this arrangement, there is no danger of locking the front wheels by over-application of pedal pressure in an emergency.



Assembled view of the Stewart-Warner power amplifying unit

Commodity

1. Automobile frames
2. Automobile fenders, not nested
3. Cans or pails, not nested
4. Culverts, galvanized iron, 12 in. or under in diameter
5. Culverts, galvanized iron, 12 in. or over in diameter.
6. Cotton felt, in compressed bales, any quantity
7. Cushions, vehicle seat or seat back or furniture cushions, but not pillows
8. Decorations or ornaments, Christmas tree or holiday, in bales, barrels or boxes.
9. Emigrants' movables, properly boxed or crated
10. Feathers, quills, feather trimmings and millinery
11. Mixtures of ten or more different kinds of groceries such as those ordinarily shipped by wholesale grocery houses
12. Household goods, properly boxed or crated
13. Household goods, not boxed or crated, pieces under 250 cu. ft., each
14. Newspapers in boxes, bundles or crates
15. Oxygen, in steel cylinders
16. Musical instruments
17. Paper tubes
18. Trunks, traveling bags and sample cases

Special Ratings for Motor Transportation

One and one-half times first-class rates
Four times first-class rates
Double first-class rates

First-class rates

Double first-class rates

First-class rates

Double first-class rates

Double first-class rates

Double first-class rates

Four times first-class rates

Third-class rates

Double first-class rates

Six times first-class rates

Double first-class rates

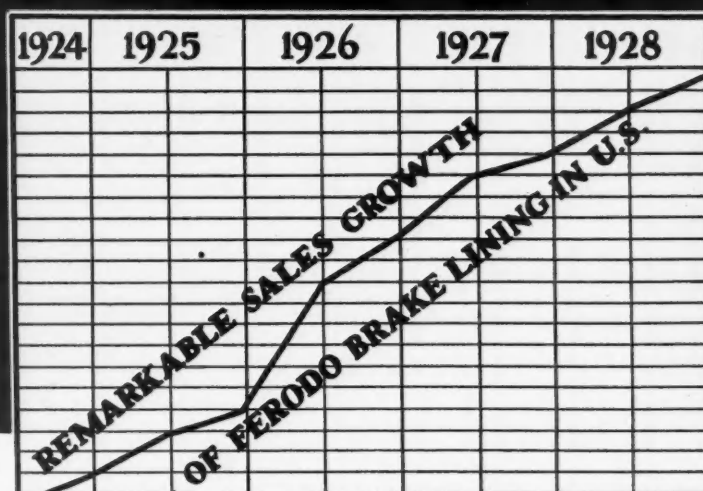
Third-class rates

Double first-class rates

One and one-half times first-class rates

Double first-class rates

**for
NEW RECORDS**



How else can you account for the swift growth of Ferodo sales? It can't be due to price, for Ferodo Brake Lining lists at 30% more a foot than ordinary linings. Yet, as the chart shows, sales have had a phenomenal increase *every* year since Ferodo was first introduced into the United States.

Ferodo *must* be better! That is the reason—that is why old customers repeatedly come back, why new users are daily proving to their complete satisfaction Ferodo's ten counts of superiority. Try out Ferodo Brake Lining on one of your vehicles—then you will agree with thousands of other users that Ferodo *is* better.

1. High Average wear life.
2. Constant Gripping Power (coefficient of friction) to over 550° F.
3. Safe brakes in wet weather.
4. Will not burn out.
5. Fewer adjustments.
6. No swelling or shrinkage.
7. Size accuracy—within tolerance of .005".
8. No glazing.
9. Silent, smooth operation.
10. Cheaper per mile of service.

Factory and General Offices:

New Brunswick, New Jersey

E. 7-29

FERODO

REGISTERED

BRAKE LINING

FLEET SERVICE

(Continued from page 19)

department or whether it is dignified by being handled as a subsidiary company or corporation, has all the elements necessary for profit as a separate department, and most certainly is intriguing when considered as to its possibilities for profit to the sales department.

We should not only class such a business as being of interest to the sales department, but it is also possible to secure profit to the parts and accessory department and should be of untold use to the advertising department. It seems to the writer that it has possibilities of adding to the shop work and has the additional advantage of being under such control as would permit feeding the work into the shop during slack times.

Let us consider some concrete examples and the various conclusions suggested in working them out:

John Smith buys a motor truck and he has been sold on the idea of storing his new truck with the maintenance department of the company from which he purchased the vehicle. Naturally he is satisfied with the price and terms on which he purchased the new truck and also on the monthly or annual cost which they propose to charge for maintaining it. In other words, the business relations of the dealer and the buyer are cordial at this point. The advantages to John Smith in having his dealer maintain his new vehicle appear to be essentially as follows:

1. The distributor's maintenance department can take care of the new truck cheaper and better than anyone else.
2. Such a maintenance department should be able to keep its own make of vehicle continuously in service, barring accidents.
3. In the case of wrecks and accidents the maintenance department should be able to supply a satisfactory substitute for the owner's truck until his own truck is back in service.
4. John Smith's truck would be kept more presentable, cleaner, etc., and therefore more properly represent John Smith's business to the general public.
5. John Smith would be certain of securing prompt attention from the maintenance department of his dealer because of the influence of the sales department, which would be looking to John Smith for resales and also for new prospects among his associates.

The dealer's side of this concrete example offers, in general, the following assets:

1. A better satisfied customer.
2. A greater certainty of resale.
3. Less policy charges on account of free service.
4. A profitable maintenance business,

as a by-product of his sales department.

5. Eliminating independent repair shops and efforts of competing salesmen by keeping the client away from such places.
6. Word-of-mouth advertising that would naturally come from the ability to give such service.
7. An aid to the parts and shop departments by feeding work from maintenance customers during slack periods.

Our observation leads us to believe that any live maintenance department of a truck distributor or a factory branch could secure sufficient accounts of this kind on short notice to make it a paying department. Such a department might be extended to take in all makes of trucks, but we are of the opinion that there are few distributors who would want to start such a department with fewer than 75 vehicles or more than 200 vehicles.

Unless factories operating their own branches or distributors in the large centers take some actual interest in their own maintenance departments they will find a certain percentage of their business, which they have been doing directly with the truck operator, will have to be handled through the owners of truck maintenance companies. The storing and maintaining of trucks is becoming a greater problem each year. Regardless of whose capital is invested in such a business it is of great interest to truck distributors and truck manufacturers, for they must keep most of their own customers in order to remain in business. Under present conditions many resales fail to materialize because of dissatisfaction and through lack of contact with the original purchaser.

Most of the new truck sales are made to owners of other trucks. This would indicate that there are only so many prospective truck buyers to be considered; therefore it behooves every manufacturer of motor trucks to take care of his own customers first and gradually extend to new customers as his facilities permit.

For example, should a distributor have 500 different truck accounts operating his make of truck, he should be able to replace at least 100 of these vehicles each 12 months. In order to do this he will of necessity have to see to it that his contacts with his customers have been satisfactory. With these same 500 accounts he should be able to sell 50 additional pieces of equipment each year on account of natural business expansion and on account of replacement of other makes of equipment. These estimates do not take into consideration the securing of any new clients. In practice (during the past 10 years) two-thirds of the motor truck

sales of any given distributor have been to new clients and the result has been that the popular makes of used trucks have commanded a trade-in value all out of proportion to the price of a new vehicle of the same make and size. This writer thinks that the average truck distributor or factory branch would be more profitable if run on the basis of taking care of its own customers first. The day-to-day maintenance and care of vehicles which we have sold our clients should have first consideration, otherwise our customers will be driving some other make of truck at the time of their next purchase.

Truck drivers, truck operators and owners and truck sales departments have a reputation of being "hardboiled" and this idea seems to be universal. It seems to us that the "hardboiled" attitude of truck owners and drivers has been forced on them by inefficiency and lack of understanding of the truck owner's and operator's needs by service departments generally. There is no business as important as the maintenance of uninterrupted transportation, and this particularly applies to motor truck transportation. Merchandise has to move because it is the lifeblood of business. Most truck operators have found it difficult to get the same prompt action from the service and repair shops that is required of them by their respective customers.

Hudson in Truck Field

(Continued from page 35)

pump and splash type as on the Hudson, while thermo-syphon cooling is assisted by a large radiator equipped with manually controlled shutters. Other mechanical details include a single plate clutch, three-speed standard shift transmission in unit with the engine, semi-floating rear axle with 5.6 to 1 reduction, and two-shoe four-wheel Bendix brakes.

Semi-elliptic springs all around are mounted in Tryon shackles, 8-leaved front springs being 36 in., and 12-leaved rear springs 53 in. long. The parking brake operates on all four wheels, similarly to the foot brake, and on the same drums.

Equipment includes, in addition to the usual instrument board, an engine thermometer on the dash and a combination gasoline and oil level dash gage as on the Hudson and Essex passenger cars, both being electrically operated on the same indicator, by the depressing or releasing of a dash switch. Further there is provided an Electrolock, AC air cleaner, two filament headlights, spare tire well on the right front fender, extra rim with tire lock, and curtains for the screen and canopy express at no extra cost.

Standard equipment includes windshield wiper, rear-view mirror, adjustable steering column, combination tail and stop light, cowl ventilator, fender well, etc.

In the opinion of many motor truck manufacturers, the day is not far distant when practically *all* motor trucks will be equipped with Lockheed Hydraulic Four-Wheel Brakes

HYDRAULIC BRAKE COMPANY

DETROIT, MICHIGAN, U. S. A.

TRACTION TESTS

(Continued from page 32)

the rear, giving the appearance of a road-roller except for the fact that the assembly is driven from the center.

Two unusual arrangements of tires were found on the Walter and the six-wheel Coleman. The former has dual pneumatics all around but the outside pair of front tires is smaller than the inner tires. In ordinary operation the larger tires contact the ground and the smaller tires do not interfere with steering. When going through sand and mud both pairs of front tires are supporting the load. The Coleman six-wheel models, described in more detail later in this article, were shown with single tires, with singles on the front and duals on the rear and with duals on all six wheels.

Distributing weight more evenly between front and rear wheels than is customary also reduces cutting-in of rear wheels in soft ground and aids pulling up steep hills. To accomplish this the Hug Roadbuilder two-wheel drive powerplant overhangs the front axle and this design appears in the FWD, Coleman, Freeman and Walter four-wheel drive trucks.

Several makers exhibited new models or models announced recently. These included the Brockway-Indiana six-wheeler and a four-wheel embodying the same powerplant, three Coleman six-wheelers, the four-wheel-drive six-wheel FWD, Wisconsin tandem worm drive rear axle assembly for six-wheel trucks, Omort truck, and the Moreland six-wheelers.

The Brockway-Indiana heavy-duty four-wheel model 50 and the six-wheel model SW-40 both include a six-cylinder 4½ by 5½ in. engine, a seven-speed transmission with overdrive on seventh and worm drive rear axles. A single Timken rear axle is used in the four-wheel unit, and the Timken tandem rear axle in the six-wheeler. Four-wheel air brakes are employed on the four-wheel model, and air brakes are applied on the four rear wheels of the six-wheeler and may be supplied on the front wheels if desired.

Coleman exhibited three models which have been sold to the U. S. Army. These included a two-ton four-wheel four-wheel drive truck, with 38 by 9 in. pneumatic tires on all four wheels. This truck is a new model C-25. Also a six-wheeler with single tires on the front and dual tires on four rear wheels. The six-wheeler with dual tires on all six wheels is an experimental truck and is the property of the Army Quartermaster Corps.

Rated at six tons, the FWD six-wheel truck incorporates drive on the front wheels and on the forward pair of rear wheels similar to that used in the four-wheel FWD's. The extra wheels are placed to the rear of the rear drive wheels and are mounted on a

4 in. solid steel shaft. The two rear axles are connected to the frame by means of two inverted semi-elliptic springs on each side. The ends of the springs are attached to the axles by spherical bearings, and the centers are bolted to pivoted castings.

Omort exhibited a new model 2½-3-ton road builder dump truck. Major units include a 4 by 5 in. four-cylinder Hercules OX engine, Fuller four-speed transmission with Fuller two-speed clutch, Wisconsin dual reduction rear axle. A feature of the rear axle assembly is the spring leaf radius rods.

Moreland four-wheel drive six-wheel trucks are made in three capacities, gross weight ratings of 23,000, 30,000 and 34,000 lb. The tandem worm drive rear axles have internal brakes on the four rear wheels operated by vacuum booster.

A 1½-ton Relay truck was shown in

action in the booth, large doors on both sides of the building making this possible. This truck incorporates the model 20 Relay axle, which differs in construction from other Relay axles, although it includes the fundamental Relay action.

Drive and torque of the Wisconsin tandem worm drive rear axle are taken by rods equipped with spherical bearings at the ends. Drive units of the axles are connected with a rod, placed at the side on top, and a second rod extends to a frame cross-member. Radius rods also connect the axle with the frame side rails.

Conventional trucks shown included: Ford, International Harvester, Dodge, Fargo, Reo and Stewart.

The Diamond T six-wheeler shown has been described in these columns, as have the Hug Roadbuilder truck and International Harvester six-speed special. Maccar exhibited a six-wheeler with Wisconsin tandem worm drive rear axles. The American Cable Co. displayed a double type Tru-Stop transmission brake, which includes a pair of shoes on either side of a single disk.

Fit the Tire to the Load

(Continued from page 21)

Truck tires are designed to perform a certain service. Each size is intended to carry a predetermined load and although there may be exceptions, each tire will do just so much work. If it carries the weight it is capable of bearing efficiently it will render the service for which it was built. If it carries less load it will last longer. If it carries more load it will not last as long.

How tire mileage is reduced as the load is increased is indicated on the accompanying chart which was compiled by the Firestone Tire & Rubber Co. The mileage given are relative only, and obviously are not guaranteed. The curves do show, however, the sharp falling off in mileage which takes place when a tire is loaded far beyond its rated capacity.

Referring to the chart we find that a 30 x 5 in. heavy-duty tire with a rated carrying capacity of 1700 lb. will carry that weight 22,000 miles. But suppose the tire is called upon to carry twice that much, or 3400 lb.? A 1½-ton truck with a heavy body carrying 2½ tons will impose this burden on the rear tires. Mileage drops to 5500 miles. Doubling the load has brought mileage down to one-quarter.

Supposing further that operating conditions require that a 3400 lb. load be carried on each rear wheel, let us see what larger tires will do. The chart indicates that a 32 x 6 in. tire will carry this load 8500 miles; a 34 x 7, 14,000, and a 36 x 8 will run up a mileage of 20,500 miles.

Based upon a typical list price the cost per tire for 10,000 miles of oper-

ation with a rear wheel load of 3400 lb. on the various size tires will be approximately as follows:

30 x 5	\$51.08
32 x 6	54.90
34 x 7	47.10
36 x 8	45.80

Using dual rear tires makes it easy to have the same size tires on front and rear wheels, which is an advantage in many instances. Granting that dual tires have twice the carrying capacity of single tires of the same size these same figures show that 3400 lb. could be carried 22,000 miles by dual 30 x 5 in. tires with a resulting cost for 10,000 miles of operation of approximately \$25.54.

That well-known saying that "circumstances alter cases" evidently applies to tire equipment, as reference to specification tables in this issue will show. Tires for 1½-ton trucks range from 30 x 5 in., singles to 36 x 8 in., singles and 32 x 6 in. duals on the rear wheels. The rated carrying capacity of these tires likewise extends from 1700 lb. to 4400 lb. per rear wheel.

Competitive conditions frequently place a truck salesman in a position where he is reluctant to recommend oversize tire equipment. He suggests that 32 x 6's might well be substituted for the 30 x 5 standard equipment, only to be told that a competitor advises that 30 x 5 is plenty large enough. The cost of oversize tires is something to be considered in the total price and any live salesman is careful about adding anything to delivered price.

Obviously there is need of friendly cooperation between salesman and prospect and, perhaps, the tire dealer, to determine the tire equipment best suited to the needs of the prospective truck owner.

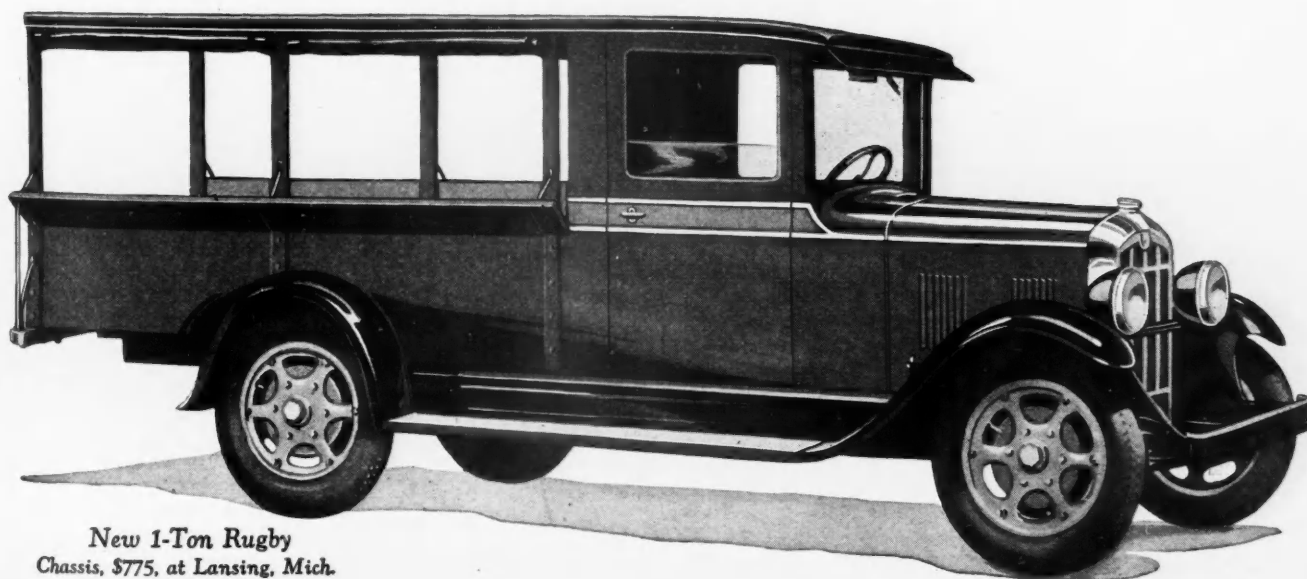


RUGBY

A GOOD TRUCK BUILT BY DURANT

The new Durant-built 1-ton Rugby is the first truck with 6 forward speeds under \$800. It offers a wide and practical line of handsome bodies on a correctly balanced chassis, typically Durant in staunchness.

DURANT MOTORS, INC., DETROIT, U. S. A.
FACTORIES—LANSING, MICH., OAKLAND, CAL., LEASIDE, ONT.



New 1-Ton Rugby
Chassis, \$775, at Lansing, Mich.

GLASS DELIVERIES

(Continued from page 25)

plane, will probably best meet the requirements of the glass dealer, whose business consists mostly of small sizes with an occasional order for a large size. Very large sizes can be accommodated by attaching an extension to the rack. Inside vertical bodies are best fitted to the needs of wholesalers and to large dealers furnishing large quantities of glass.

The following is a resumé of various glass bodies in use today. Of the horizontal type, the body used by Hires Turner, Philadelphia (Fig. 4), is typical of this class. It is an express body of the high side type with flares parallel to the ground. The rack is constructed of 3 x 4 and 1 x 6-in. boards and measures 90 x 126 in. Small sizes of glass in boxes are carried underneath. The chassis is a one-ton Chevrolet. Another body in the same class is a custom-built York-Hoover body. This body is essentially of the express type with four posts on each side, extending a few inches above the sideboards for supporting a permanently fixed horizontal rack. A feature of this particular job is 12-in. hinged wings, which when thrown outward extend the width of the rack from 72 to 96 in. This body is offered in body sizes ranging in length from 98 to 120 in. and width from 44 to 60 in., while the rack without wings is offered in lengths from 115 to 150 in., in 72-in. widths.

An excellent example of a combination body is the job built by the Providence Body Co., Providence, R. I., for the Superior Glass Co. (Fig. 2). This body is designed to carry glass on a flat platform supported by the express sides or by a vertical rack quickly attachable to the right side. Vertical stays are placed opposite each post to hold the glass in position. These stays are attached in a slot at the upper and lower parts of the rack. They are adjusted and held tight against the glass by thumb screws to protect the glass against twisting. This body has been in use for some time and glass has been transported great distances with no breakages against its record.

Originally designed for converting from horizontal to vertical carriage, the delivery truck used by M. Krakowitz, Philadelphia glass dealer, is now used exclusively for vertical haulage of glass (Fig. 1). Frequent need for the vertical rack made conversion impracticable from time and labor standpoints so the management decided to use this truck entirely for vertical carriage of glass. The construction, as the illustration reveals, is simple, consisting of a 90 x 172 in. main rack and a 42-in. extension ironed to the main rack. The lower part of the rack is secured to the chassis frame by iron braces while the upper section is supported by three iron

bars swiveled to the top edge of the opposite body side. Makeshift stays were constructed for this particular delivery because of the immense size of the glass, 136 x 145 in. To balance the 500 lb. sheet of glass and 1000 lb. rack, 100 lb. tubs of putty are placed along the left side of the body.

In order to obtain balance and to increase carrying capacity, a New York dealer erected a frame in the general shape of the letter "A" on his delivery chassis (Fig. 3). Glass is carried vertically on either leg of the "A." This job is particularly convenient in congested centers where one-way traffic regulations exist, as the glass can be mounted on either the right or left side, according to the flow of traffic at the point of delivery.

Of the inside vertical type, the jobs used by the Pittsburgh Plate Glass Co. in Philadelphia and Long Island City and the Conroy-Prugh Glass Co., Pittsburgh, Pa. (Fig. 5), are typical examples. The principle of construction of both these jobs are identical, differing only in minor details and method of

assembly. The racks of both jobs are a fixed part of the body, uprights are used to brace the racks, running boards are provided one-third down from the top and extensions to increase the height may be added. The Pittsburgh body was made by H. Kaiser & Co., Inc., while the Conroy unit was designed and built by Wm. Beckert & Son, Pittsburgh. The latter is mounted on a Model KB Garford and is 204 in. long, 36 in. wide and 104 to 132 in. high.

A novel body of the closed inside vertical type is an English job made by Messrs. Albert E. Ewer, London, for a large glass merchant. The vehicle is claimed to be the largest of its kind in the country, having a capacity of 2½ tons. Built on a Maudslay chassis, this body is of the van type, with a roof and back which can be opened on hinges. The overall length is 27 ft.; height, 13 ft.; width, 7 ft. The body work is of ash, braced with steel plates and paneling of ½-in. boards. A 4-ft. tail-gate and two hinged doors make up the rear. The folding roof is specially arranged for accommodating pieces of plate glass which are higher than 10½ ft. The vehicle is used on contract to cover 1000 miles per week and is said to be effecting deliveries with clockwork regularity. Large ramps are carried in the body for hooking onto the tailboard when loading and unloading. Racks are well padded.

TRUCK POWER

(Continued from page 17)

tractor found many uses for the winch which he had overlooked when considering purchase of a new truck.

Many chances to save labor and time and money are being overlooked, according to one of the executives consulted in preparation of this article. He has been an advocate of more extensive use of special truck equipment in his own organization, and while thinking along these lines has noticed many opportunities for others, in other lines of work, to avail themselves of the modern motor truck as a labor-saving machine as well as a means of transportation.

"We could not get our work done at all without our special trucks," said another advocate of dual-duty trucks. "There are lots of truck owners who could save money, as we are doing, by surveying their operations with the idea of applying truck engine power to jobs now done by hand."

Need of a change in cost accounting for winch trucks which travel very little, but have the engine running almost all the time, directed the attention of the fleet superintendent and other officials of a large public utility company to the usefulness of trucks for other purposes than transportation. In this fleet, trucks were charged

to using departments on a mileage or time basis, but neither seemed an accurate way of charging for winch service. This incident brought about a renewed interest in truck power equipment in this organization.

Every one of the fleet superintendents interviewed on the subject, in connection with this article, is a believer in the labor-saving possibilities of trucks. A few of them are enthusiastic and expressed the opinion that dealers and manufacturers might profitably devote some additional time and thought to the subject.

Fleet owners who have use for special equipment face a situation now which is quite different from that which existed a few years ago. Much of the early equipment was designed, and in some cases built, by the truck owners to meet their individual needs. At the present time, however, a variety of equipment is available as optional factory equipment, and many factories maintain special equipment departments to furnish any sort of equipment which may be required.

Acknowledgment is made of courtesy of E. J. Jahn, Supt. of Transportation, Consolidated Gas, Electric Light & Power Co., Baltimore, Md., in furnishing five photographs for this article.

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks Will be Found at the End of Gasoline Commercial Cars

These Chassis Which Are Sold and Recommended for Bus Use Are Designated in the Following Table by Reference Sign (S) in Front of the Name

For Motor Bus Chassis See Pages 76 and 77

* Changes

† New Models

(Where prices are not given it is because we have been unable to get them from authoritative sources)

Key of abbreviations page 78

Trade Name and Model	General				Engine				Electrical System		Clutch	Gearset	Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase		Chassis Weight (lbs.)						
	Chassis Price	Standard Wheelbase (Inches)	Maximum Wheelbase	Tire Size	Make and Model	Number of Cylinders	Bore and Stroke	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System			Governor (Make)	Radiator (Make)	Fuel System				Ignition System (Make)	Generator and Starter (Make)		Type	Total Reduction in High	Total Reduction in Low	Brakes, Location	Cab to rear of frame	Cab to rear axle
															Carburetor (Make)	Fuel Feed											
1000 Pounds																											
Chevrolet Int. Com.	400	107	107	B 4.50/20 B 4.50x20	Owa	6-34x34	26.3	26.3	H	PG	Non	Har	Car	D-R	D-R	P. Roc	Owa	Int.	Owa	Int.	26%	26%	1825				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
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Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car	D-R	D-R	P. Roc	Owa	Owa	Owa	Owa	26%	26%	1800				
Dodge Brothers	545	109	109	B 28x4.75 B 28x4.75	Owa	6-34x34	21.0	21.0	L	PC	Non	McC	Car														

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Trade Name and Model	General			Engine							Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase		Chassis Weight (lbs.)			
	Tire Size		Chassis Price	Standard Wheelbase (inches)	Maximum Wheelbase (inches)	Rear (inches)	Front (inches)	Make and Model	Number of Cylinders	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System		Governor (Make)	Radiator (Make)	Fuel System		Ignition System				Generator and Starter (Make)	Type		Total Reduction in High	Total Reduction in Low	Brakes, Location
	Standard Wheelbase	Maximum Wheelbase														Carburetor (Make)	Fuel Feed										
1 Ton—Cont'd																											
Rugby Exp.	P 30x5	P 30x5	975	128	128	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Sandford 7.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Sandford 8.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Sandford 9.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Service 20Y.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Stewart 20Y.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Studebaker GD-N.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
United 16.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
United 16C.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
U. S. U.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Wachusett 8.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
White 15B.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
White 60.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
Willy-Knight T-100.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
World.	P 30x5	P 30x5	120	120	120	30x5	30x5	Con 31L	6-37x44	18.2	L	PC	Non	Fed	Til	A-L	A-L	A-L	P. Own	B-L 20	B	5.39	22.4	E*	87	491	2510
1 1/4 Ton																											
Atterbury 20B6.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Biederman.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway Junior.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	3470
Brookway T-10.	P 30x5	P 30x5	1395	132	132	30x5	30x5	Lye 48L	6-37x44	25.3	L	PC	Non	Fed	Zen	A-L	A-L	A-L	D. B-L	B-L 31	B	5.85	29.17	G	108	55	

1. The first part of the document is a list of names and their corresponding addresses. The names are listed in a column on the left, and the addresses are listed in a column on the right. The names are: John Doe, Jane Smith, and Bob Johnson. The addresses are: 123 Main St, 456 Elm St, and 789 Oak St.

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Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase				
	Chassis Price	Standard Wheelbase (Inches)	Tire Size	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System	Governor (Make)	Radiator (Make)	Fuel System			Ignition System (Make)	Generator and Starter (Make)	Type and Make	Location	No. of Forward Speeds	Universals (Make)			Type	Total Reduction in High	Total Reduction in Low	Brakes, Location	
									Carburetor	Fuel Feed														
1 1/2 Ton—Cont'd																								
Witt-Will C2	144	144	P 30x5	P 30x5	Con 16C	6-33x4 1/2	27.3	L	PC	Non	Per	Zen	D-R	D-R	D-B-L	S	7.4	46.99	Tim 14703	Ros	4300			
Woods 32	1895	160	P 30x5	P 30x5	Her WXA2	6-31x4 1/2	29.4	L	PC	Han	Chi	Zen	A-L	A-L	P. Lon	S	5.83	29.15	Tim	Ros	4450			
World D88	147 1/2	147 1/2	P 30x5	P 30x5	Lye	8-27x4 1/2	26.4	L	PC	Han	Mod	Zen	A-L	A-L	P. Lon	S	6.16	37	Tim	Han	4000			
1 3/4 Ton																								
Sanford AX	150	150	P 34x7	P 34x7	Con 18E	6-33x4	27.3	L	PC	Non	Fed	Strom	D-R	D-R	D-B-L	S	6.38	26.4	Eat	Ros	3000			
2 Ton																								
Acme 44	162	162	P 32x6	P 32x6	Con S4	4-41x4 1/2	28.9	L	PC	Non	Per	Str	A-L	A-L	D-B-L	W	6.25	33.4	Tim 14703	Ros	4000			
Acme 46	162	162	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Per	Str	A-L	A-L	D-B-L	W	7.33	39.2	Tim 14703	Ros	4000			
Acme 340	162	162	P 32x6	P 32x6	Con S4	4-41x4 1/2	28.9	L	PC	Non	Per	Str	A-L	A-L	D-B-L	W	6.8	32.6	Tim 14703H	Ros	4000			
Acme 346	162	162	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Per	Str	A-L	A-L	D-B-L	W	6.8	32.6	Tim 14703H	Ros	4000			
Acorn 40	2500	144	P 34x5	P 34x5	Con S4	4-41x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Am. La France Chief	3050	192	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Armstrong 40	187	187	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Armstrong 40-6	187	187	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Atterbury 29G6	1985	145	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Autocar SD	3000	150	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Brookway EYW	150 1/2	164	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Brookway S	150 1/2	164	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Chicago 20A	135 1/2	135 1/2	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Chicago 21A	135 1/2	135 1/2	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Clydesdale 9	162	162	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Clydesdale 9	162	162	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Coleman C-25	109	109	P 34x7	P 34x7	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Commer 40Z	3240	163	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Concord GX-6	183	183	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Corbett 646	150	150	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Day-Elder HF	181	181	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Day-Elder HBF	156	156	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Defiance T1621	175	175	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Diamond T302	1650	157 1/2	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dion	2950	146	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9	L	PC	Non	Chi	Zen	D-R	D-R	D-B-L	W	Opt	Opt	Tim 14703H	Ros	4000			
Dodge Brothers	1445	114	P 32x6	P 32x6	Con S4	6-33x4 1/2	28.9																	

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Trade Name and Model	General			Engine					Electrical System		Clutch	Gearset		Rear Axle		Gear Ratios		Front Axle Make and Model	Steering Gear (Make)	Standard Wheelbase				
	Chassis Price	Standard Wheelbase (inches)	Maximum Wheelbase (inches)	Tire Size	Rear (inches)	Make and Model	Bore and Stroke	N.A.C.C. Rated H.P.	Valve Arrangement	Oiling System		Governor (Make)	Radiator (Make)	Fuel System		Ignition System (Make)	Generator and Starter (Make)			Type and Make	Make and Model	Location	No. of Forward Speeds	Universal (Make)
														Carburetor (Make)	Fuel Feed									
2 1/2 Ton—Cont'd																								
Fisher Heavy Duty	4415	156 1/2	190	S 36x5	S 36x10	Con 18R	6-4x4 1/2	38.4	H	FP	Non	Lon	Str	V	A-L	A-L	D. B-L	Tim 65000H	W	8.66	53.2	120		
Garford 50Z	1790	135	175	P 32x6	P 32x6	Bud BUS	6-4x4 1/2	38.4	L	PC	Han	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
General Motors T42	1790	135	175	P 32x6	P 32x6	Bud BUS	6-4x4 1/2	38.4	L	PC	Han	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Goldfrieson W44	165	165	198	P 34x7	P 34x7	Wau 6XK	6-4x4 1/2	38.4	L	PC	Pie	Chi	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
G-P 574	154	175	198	P 34x7	P 34x7	Wau 6XK	6-4x4 1/2	38.4	L	PC	Pie	Chi	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Gramm 564N	2985	150	198	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Gramm-Bernstein B6	144	144	166	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Gramm-Bernstein C6	144	144	166	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
*Guider E6	3250	172	184	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Harvey WG6	3500	185	185	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Hawkeye 50-75	210	210	225	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Hawkeye 50-48	Opt	185	185	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Hawkeye 50-60	197	197	197	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
*Hendrickson ST	3400	150	195	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Hug 26	127	127	127	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Hug 84	127	127	127	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Indiana 115A	162 1/2	162 1/2	162 1/2	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Indiana 127S	136	136	136	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Indiana 615A	148	148	148	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Int. Harvester HS54	188	188	188	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Int. Harvester HS54C	3130	168	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
*King Zeller 45	156	156	156	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Kiesel	2950	180	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Kiebler	3850	163	163	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
*Lange O	177	177	177	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Larabee HB25	2900	166	182	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Le Moon HB26	3250	166	182	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Le Moon HB27	3600	166	182	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Le Moon HB28	149	149	149	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Master 46	3500	140 1/2	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Master 48	3500	140 1/2	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Master 50B	3850	142	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Noble 150B	178	178	178	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Oneida O9	180	180	180	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Oakleaf M	3250	146	165	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Oakleaf L	3250	146	165	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Relay 50C	4415	175	193	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Republic F1	155	155	155	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Republic H1	165	165	165	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Republic 60	122	122	122	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Republic 85	122	122	122	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Republic 85-6	170	170	170	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Sanford 30	166	166	166	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Service 50Z	4415	175	193	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Standard 21 3/4 K	147	147	147	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Standard 21 3/4 KS	147	147	147	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Sterling DW12-64 XL	2985	150	190	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Steward 18X	2985	150	190	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Steward 77	2885	158	193	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
United 50C	2395	150	165	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Valley	2495	148	165	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Victor 45	170	170	170	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
Wachusett L	3750	170	190	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim 65700H	W	8.66	53.2	120		
White 51A	2545	150	150	P 32x6	P 32x6	Con 18R	6-4x4 1/2	38.4	L	PC	Non	Own	Zen	V	D-R	D-R	D. B-L	Tim						

155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
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**The Commercial Car Journal
and Operation & Maintenance**

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*The Commercial Car Journal
and Operation & Maintenance*

5 1/2 Ton and Over—Cont'd

*Sterling EC35-66AB

United 100

U. S. T. 100

Walter FHR

White 52

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July, 1929

Gasoline Tractor-Trucks

Amer. La France 5 Ton

Amer. La France 7 Ton

Amer. La France 10 Ton

Amer. La France 13 Ton

Amer. La France 15 Ton

Armstrong 30

Armstrong 60

Armstrong 70

Autocar HT

Autocar HST

Autocar SHST

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July, 1929

Motor Bus Chassis Specifications

Key of abbreviations page 78

MAKE AND MODEL	GENERAL			ENGINE			ELECTRICAL SYSTEM			TRANSMISSION			REAR AXLE		FRONT AXLE	TIRES AND WHEELS			DIMENSIONS (In.)										
	Seating Capacity	WEIGHT		Make and Model	Number of Cylinders, Bore and Stroke	Radiator Make	Carburetor Make	Ignition System Make	Generator and Starter Make	BATTERY Voltage and Amp. Hr. Cap.	Normal Speed	CLUTCH	GEARSET		Make and Model	Universal	Make and Model	Final Drive	Brake Location	Make and Model	Steering Gear Make	Front	Rear	Wheels—Make		Turning Radius (Ft.)	Floor Height	Length	Width
		Chassis Only	Chassis with Body										Recommended Body Allowance	Wheelbase															

ACF 508.....	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	P. B-L	B-L 55	Tim 65252	W	G	Tim 1660	Ros	P 38x7	DP38x7	Bud	37	23	333 3/4	96
ACF 511.....	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	P. B-L	B-L 60	Tim 6530	W	C	Tim 1660	Ran	P 38x9	DP38x9	Bud	39	26	359	94
ACF 601.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	D. B-L	B-L 55	Tim 65011	W	E	Tim 15705	Ros	P 34x7 1/2	DP34x7 1/2	Bud	33	24	301	91 1/4
ACF 602.....	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	D. B-L	B-L 55	Tim 65195	W	E	Tim 15705	Ros	P 34x7 1/2	B306x3.25	Bud	33	24	301	91 1/2
Acme 116.....	18	4910	5460	.....	.....	.....	.....	.....	.....	.....	.....	D. B-L	B-L 51	W 67410	R	A	Shu	Ros	P 32x6	W32x6	Bot	.....	21 1/4	259	83 1/2

Two (Engine and Transmission)

Electric Commercial Cars

Name and Model Number	Total Weight Resting on Four Tires	Chassis Weight—Exclusive of Battery	Minimum Load Capacity	Maximum Load Capacity	Chassis Price	Maximum Speed	Location of Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Spring	Front Tires	Rear Tires	Steering Gear	Wheelbase	Per Cent of Weight on Rear Wheels
O. B-B.....						13			G-E	Own	C	D			S 36x4	DS36x3½	Own	107	
O. B-C.....						11			G-E	Own	C	D			S 36x5	DS36x4	Own	135	
O. B-D.....						10			G-E	Own	C	D			S 36x6	DS36x5	Own	143	
Walker 10.....	2400		1500	1750	14	H&S	60		G-E	Own	4	S	Cla	Mat	S 32x3½	S 32x4	Ros	108°	66
Walker 20.....	3200		1500	2000	2450	15	A	50	Wes	Own	5	Own	Own	Mat	S 34x3½	S 36x4	Ros	94°	66
Walker 25.....	3500		2000	3000	2550	14	A	50	Wes	Own	5	Own	Own	Mat	S 34x4	S 36x5	Ros	101°	65
Walker 45.....	4400		4000	5000	3300	14	A	50	Wes	Own	5	Own	Own	Mat	S 36x4	S 36x6	Ros	114°	66
Walker 50.....	4800		5000	6000	3450	13	A	50	Wes	Own	5	Own	Own	Mat	S 36x5	S 36x8	Ros	126°	66
Walker 65.....	7000		7000	9000	4350	11	A	50	G-E	Own	5	Own	Own	Mat	S 36x5	DS40x5	Ros	131°	66
Walker 75.....	7800		10000	14000	4500	10	A	50	G-E	Own	5	Own	Own	Mat	S 36x6	DS40x6	Ros	141°	66
Ward B.....	6500	2300				14	S		*	Own	4	W	Own	Eat	P 30x5	P 30x5	Ros	91	
Ward C.....	8400	2850				13	S			Own	4	W	Own	Eat	P 30x5	P 32x6	Ros	96	
Ward E.....	13000	4100				12½	A			Own	4	W	Wis	Eat	S 34x5	S 36x7	Ros	114	
Ward G.....	17000	4950				11	A			Own	5	W	Wis	Eat	S 36x8	S 36x8	Ros	128	
Ward K.....	25000	7750				10	A		*	Own	5	W	Wis	Eat	S 36x6	S 36x10	Ros	160	
Ward KS.....	30000	8075				9½	A		*	Own	5	W	Wis	Eat	S 36x7	DS36x7	Ros	160	

NOTE: Battery Equipment on all above makes is at the option of the purchaser. Battery Location Abbreviations: A-amidships; H-under hood; and S-under seat. *G-E or Wes

KEY OF ABBREVIATIONS

For addresses of manufacturers listed below see Chilton Catalog and Directory

Wheelbase
*More than one wheelbase furnished.

Tires
B—Balloons.
P—Pneumatics standard equip.
DP—Dual pneumatics standard equipment.
S—Solids.
DS—Dual solids.
*—Tires at extra cost.
†—Pneumatics can be furnished at extra cost.

Engine
*Models also furnished with engine under seat.
Bud—Buda Co.
Con—Continental M. Corp.
D—Head and Side.
FP—Full Pressure to all bearings including wrist pins.
H—Overhead.
HaS—American Car & Fdy. Co.
Her—Hercules Motor Corp.
I—In Head.
Jackson—Master M. T. Mfg. Co.
L—L-Head.
Lyc—Lycoming M. Corp.
PC—Pressure to all crankshaft and connecting-rod bearings.
PG—Pump, Gravity & Splash.
PS—Pressure with splash.
SP—Circulating splash.
T—T-Head.
Wau—Waukesha M. Co.
Wis—Wisconsin M. Mfg. Co.
Yell—Yellow Sleeve V. E. Wks.
X—Sleeve.

Governor
Dup—Eisemann Magneto Corp.
Han—Handy Gov. Co.
K. P.—Handy Gov. Co.
McC—E. R. Klemm.
Mon—Monarch Gov. Co.
Non—Not Supplied.
Pha—Bethlehem Fabricators, Inc.
Pie—Pierce Governor Co.
Sim—Eisemann Magneto Corp.
Wau—Waukesha M. Co.

Radiator
Bow—Bowerbank, E. R. Co.
Bus—Bush Mfg. Co.
Chi—Chicago Mfg. Co.
Fed—Feddars Mfg. Co.
G&O—G. & O. Mfg. Co.
Har—Harrison Rad. Corp.
Hex—Hexcel Rad. Co.
Lon—Long Mfg. Co.
McC—McCord Rad. & Mfg. Co.
McK—McKinnon Dash Co.
Mod—Modine Mfg. Co.
Per—Perfex Corp.
R-T—Rome-Turney Rad. Co.
U. S.—U. S. Cartridge Co.
You—Young Rad. Co.

Fuel System
B.B.—Penberthy Injector Co.
Car—Carter Carburetor Co.
E—Electric Pump.
G—Gravity.
Mar—Marvel Carburetor Co.
O—Mechanical Pump.
P—Pressure.
Sch—Wheeler Schebler Car. Co.
Ste—Detroit Lubricator Co.
Str—Stromberg Motor Dev. Co.
Til—Tillotson Mfg. Co.
V—Vacuum.
Zen—Zenith-Detroit Corp.

Electrical Systems
†—Generator & Starter at Extra Cost.
†—Starter not supplied, Generator at Extra Cost.
*—Starter at Extra Cost.
A-L—Electric Auto-Lite Corp.
Apo—Apollo Magneto Corp.
Bos-A—Am. Bosch Magneto Co.
Bos-R—Rob. Bosch Magneto Co.
Con—Conn. Tel. & Elec. Co.
DJ—DeJon Elec. Corp.
D-R—Delco-Remy Co.
Dyn—Owen Dyneto Corp.
Eis—Eisemann Magneto Corp.
Exi—Electric S. B. Co.
Gor—R. J. Gorman Co., Inc.
L-N—Leece-Neville Co.

N-E—North East Elect. Co.
Non—Not Supplied.
Pol—Prest-O-Lite Co.
Sci—Scintilla Magneto Co.
Spl—Splittorf Electrical Co.
USL—USL Battery Corp.
Ves—Vesta Battery Corp.
Wil—Willard S. B. Co.

Clutch and Gearset
*—Other ratios optional.
†—Auxiliary two-speed transmission optional.
A—Amidships.
B & B—Borg & Beck Co.
B-L—Brown-Lipe Gear Co.
Cot—Cotta Trans. Corp.
Cov—Covert Gear Co.
Det—A. J. Detlaft Co.
D-G—Detroit Gear & Mach. Co.
D—Disk.
Ful—Fuller & Sons Mfg. Co.
H-S—Merchant & Evans Co.
J—Unit with Jackshaft.
K—Cone.
Lon—Long Mfg. Co.
M. M.—Mechanics Mach. Co.
Mun—Muncie Products Div.
General Motors Corp.
O—Disk in Oil.
P—Plate.
Roc—Rockford Drill. Mach. Co.
U—Unit with Engine.
W-G—Warner Gear Co.
Yell—Yellow Sleeve V. E. Wks.

Universal
B.G.—Universal Machine Co.
Blo—Blood Bros. Mach. Co.
Cle—Cleveland St. Prod. Corp.
Har—Spicer Mfg. Co.
M-E—Merchant & Evans Co.
M. M.—Mechanics Machine Co.
Pet—Cleveland Univ. Parts Co.
Pic—Pick Mfg. Co.
Spi—Spicer Mfg. Co.
The—Thermoid Rubber Co.
U-M—Universal Machine Co.
U-P—Universal Products Co.

Front and Rear Axles
*—Two speed
½—Semi-Floating.
¾—Three-Quarter Floating.
B—Straight Bevel.
Cla—Clark Equip. Co.
Col—Columbia Axle Co.
Con—Continental Axle Co.
C—Chain.
D—Dead.
Eat—Eaton Axle Co.
F—Floating.
I—Internal Gear.
R—Double Reduction.
S—Spiral Bevel.
Sal—Salisbury Axle Co.
She—Sheldon Axle & Spring Co.
Shu—Shuler Axle Co., Inc.
Tim—Timken Det. Axle Co.
W—Eaton Axle & Spring Co.
W—Worm.
Wis—Wisconsin Axle Co.

Brake
A—Rear Wheels only.
B—Driveshaft and Rear Wheels.
D—Jackshaft and Rear Wheels.
E—4-Wheel Brakes.
F—4-Wheel Brakes with emergency on jackshaft.
G—4-Wheel Brakes with emergency on driveshaft.
H—4-Wheel Brakes with emergency on rear wheels.
I—4-Wheel Brakes with emergency on propeller shaft.
J—Driveshaft.

Service Brake Type
*—Mechanical.
†—Hydraulic.
†—Vacuum Booster.
*Compressed Air.

Steering Gear
CAS—Columbus G. & P. Co.
D-G—Detroit Gear & Mach. Co.
Dod—Dodge Bros. Co.
Gem—Gemmer Mfg. Co.
Han—Hannum Mfg. Co.
Jac—Saginaw Steering Gear, Div. General Motors Corp.
Lav—Hannum Mfg. Co.
Ros—Ross Gear & Tool Co.